DOCUMENT RESUME

ED 084 368 CE 000 509

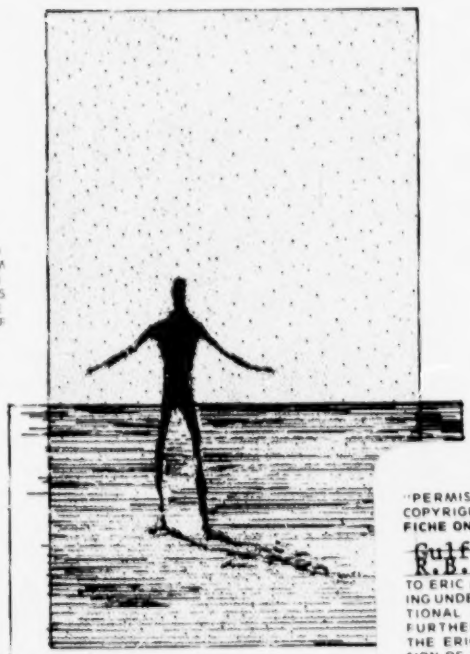
AUTHOR	Knowles, Malcolm
TITLE	The Adult Learner: A Neglected Species.
INSTITUTION	American Society for Training and Development, Madison, Wis.
PUB DATE	Apr 73
NOTE	207p.
AVAILABLE FROM	Gulf Publishing Company, P.O. Box 2608, Houston, TX 77001 ($7.95)
EDRS PRICE	MF-$0.65 HC Not Available from EDRS.
DESCRIPTORS	*Adult Education; *Adult Learning; Behavior Patterns; *Human Resources; Individual Development; Learning Characteristics; Learning Experience; Learning Motivation; *Learning Theories; Manpower Development; Organizational Development; Teaching Models; *Teaching Techniques; Training

ABSTRACT

Traditional theories of learning and the teaching practices resulting from them are reviewed. Most theories of adult learning are based on research into the learning of children, which in turn is founded upon theories of animal learning. These theories, formulated under laboratory conditions, are artificial at best--and not complex enough to apply to adult human beings. Emerging theories of adult learning, however, are based on the unique characteristics of adults as learners and result in differentiated educational practices. Human resource development (HRD) is based on many of these newer theories and serves as a guideline for action. Knowles' andragogical theory is based on four assumptions which differ from those of pedagogy: (1) changes in self-concept, (2) the role of experience, (3) readiness to learn, and (4) orientation to learning. As a guideline for developing programs and for selecting and training teachers, the andragogical model of HRD is very applicable. Among the appendixes are "Is It Skinner or Nothing" and "An Approach to a Differential Psychology of the Adult Potential." There is a eleven-page bibliography. (MS)

ED 084368

the Adult Learner: A Neglected Species



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MALCOLM KNOWLES

the Adult Learner: A Neglected Species

MALCOLM KNOWLES

Anyone involved in adult training or education needs this readable, scholarly book in his permanent reference library. *The Adult Learner: A Neglected Species* helps cut through the bewildering and often conflicting profusion of theories and research findings, interpretations, reinterpretations and analyses in the field of learning theory.

Pointing out that most adult learning theory is based on the theories of child-learning, which in turn are based on research into the learning of animals, Dr. Knowles suggests that adult human beings are a good deal more complex than laboratory-bred white mice or monkeys. He adds that the laboratory situations are at best artificial even for the animals.

In this book he briefly reviews the traditional theories about learning and describes the teaching practices in traditional schooling that have resulted from these studies.

Knowles goes on to describe in greater detail the emerging theories about adult learning based on the unique characteristics of adults as

Continued on back flap

Continued from front flap

learners. He then relates the differentiated educational practices that are flowing from these theories.

This book provides experienced trainers and educators with sound theory to support what they have known all along—that adults must be treated differently from the way children and youth have traditionally been treated in schooling.

New workers in the field will find guidelines for developing programs and for selecting and training teachers which will result in greater cost/effectiveness in their work.

Another of the respected ASTD Building Blocks of Human Potential series edited by Dr. Leonard Nadler, *Learning Theory* breaks new ground and coordinates the findings and often conflicting conclusions of learning researchers from conservative to revolutionary. This is a long-awaited reference book for every educator or manager, personnel director, human resources developer, high school or college instructor or counselor.

Dust jacket designed by Herman Woo

GULF PUBLISHING COMPANY
Box 2608 • Houston, Texas 77001

Malcolm S. Knowles

Professor of education and general consultant in adult education at Boston University School of Education, Malcolm S. Knowles has written several books and articles on adult education, leadership and group dynamics. He has provided consultation and workshop leadership and direction for over 30 companies, organizations, institutions and schools. He has also contributed to two television series on training and development.

the Adult Learner: A Neglected Species

The Adult Learner: A Neglected Species

This series of books is supported by the American Society for Training and Development as part of its continuing program to encourage publication in the field. Most of the authors are active in ASTD and have contributed to its growth over the years. The Publications Committee of ASTD is a continuing link between the editor and the publisher and the membership of ASTD.

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Malcolm Knowles

GULF PUBLISHING COMPANY
Book Publishing Division: Houston

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The Adult Learner: A Neglected Species

ISBN 0-87201-005-8

Library of Congress Catalog Card No. 73-75391

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editor's foreword

Over the past years, Malcolm Knowles has been constantly sought by human resource developers of all kinds—training directors, O.D. consultants, community developers—to help them understand learning theories as applied to adults. He has conducted sessions at many large national conferences, and the excitement among his participants has usually spread to others. Therefore, it seemed only logical that I should ask him to write down his thoughts and bring together his various sources so they could be shared by a wider audience in a more permanent form. The result is this book.

Anybody concerned with any aspect of human resource development will find this book of inestimable value. HRD is based in learning theories and now many of these theories have been brought together in one small volume. As Knowles has organized the book, you can proceed from his discussion into a search into any of the theories in more depth. Few books have contrasted these theories as well as Knowles has done in this volume.

With the help of this book, HRD personnel can halt some of the feverish search which develops when speakers drop names. The names, their theories, and some analysis will be found in this book. Also, Knowles has helped us realize that when we buy *packages* we are usually buying learning theories. Whether it is sensitivity training or programmed instruction, they are grounded in some identifiable learning theories which are clearly presented in this book.

Once again Malcolm Knowles has made a valuable contribution to the literature in the field of human resource development. We are proud to have this book in our series.

Washington, D.C.
April 1973

Leonard Nadler
Series Editor

preface

Welcome on a trip up the Amazon of educational psychology to the jungle of learning theory.

It is a strange world that we are going to explore together, with lush growth of flora and fauna with exotic names (including fossils of extinct species) and teeming with savage tribes in raging battle. I have just made a casing-the-joint trip up the river myself (surveying forty-five books and uncountable articles and research reports), and I can tell you that my head is reeling.

But I'm willing to go again, as your guide. I'll try to point out the high spots of the trip as objectively as I can. But you should know before we start that I have my own tastes, values, and prejudices, so be alert to make your own judgments about which parts of the scenery best satisfy your own tastes, values, and prejudices.

exploring the strange world of learning theory

Why Explore Learning Theory?

A good question. Perhaps you shouldn't. If you have no questions about the quality of Human Resource Development in your organization, if you are sure it's the best it can be, I'd suggest you cancel your reservation and get a refund.

But if you are a policy-level executive you may have such questions as these: Are our HRD activities based on assumptions about human nature and organizational life that are congruent with the assumptions on which our management policies are based? Is our HRD program contributing to long-run gains in our human capital, or only short-run cost reduction? Why are our HRD personnel making the decisions they are concerning priorities, activities, methods and techniques, materials and the use of outside resources (consultants, package programs, hardware, software and university courses)? Are they the best decisions? How can I assess

whether or not or to what degree the HRD program is producing the results I want?

If you are an HRD administrator, to use the breakdown of the roles of the human resource developer presented by Nadler in the foundational book in this series [Nadler, 1970, p. 151], you may have all of the above questions plus such others as: Which learning theory is most appropriate for which kind of learning, or should our entire HRD program be faithful to a single learning theory? How do I find out what learning theories are being followed by the various consultants, package programs, and other outside resources available to us? What difference might their theoretical orientation make in our HRD program? What are the implications of the various learning theories for our program development, selection and training of instructional personnel, administrative policies and practices, facilities, and program evaluation?

If you are a learning specialist (instructor, curriculum builder, methods and materials developer) you may have some of the above questions plus such others as: How can I increase my effectiveness as a learning specialist? Which techniques will be most effective for particular situations? Which learning theories are most congruent with my own view of human nature and the purpose of education? What are the implications of the various learning theories for my own role and performance?

If you are a consultant (advocate, expert, stimulator, change agent), you may have some of the above questions plus such others as: Which learning theory should I advocate under what circumstances? How shall I explain the nature and consequences of the various learning theories to my clients? What are the implications of the various learning theories for total organizational development? Which learning theory is most congruent with my conception of the role of consultant?

A good theory should provide both an explanation of phenomena and guidelines for action. But theories about human behavior also carry with them assumptions about human nature, the purpose of education, and desirable values. The better you understand the various theories, therefore, the better decisions you will be able to

make regarding learning experiences that will achieve the ends you wish to achieve.

What Is a Theory?

Webster's Seventh New Intercollegiate Dictionary gives five definitions: (1) the analysis of a set of facts in their relation to one another; (2) the general or abstract principles of a body of fact, a science, or an art; (3) a plausible or scientifically acceptable general principle or body of principles offered to explain phenomena; (4) a hypothesis assumed for the sake of argument or investigation; (5) abstract thought. Learning theorists use all five of these definitions in one way or another, but let me give you a taste of the wide variations in their usage:

First, here are some definitions-by-usage-in-context. It is my observation that most writers in this field don't expressly define the term, but expect their readers to get its meaning from the way it is used.

> The research worker needs a set of assumptions as a starting point to guide what he does, to be tested by experiment or to serve as a check on observations and insights. Without any theory his activities may be as aimless, as wasteful as the early wanderings of the explorers in North America. . . .Some knowledge of theory always aids practice. [Kidd, 1959, pp. 134-135]

> A scientist, along with the desire to satisfy his curiosity about the facts of nature, has a predilection for ordering his facts into systems of laws and theories. He is interested not only in verified facts and relationships, but in neat and parsimonious ways of summarizing these facts. Hilgard and Bower, 1966, pp. 1-2]

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> The word "theory" conveys a sense of intangibility which is forbidding to some students. To others, theory is associated with a sense of impracticality and unrealism which prompts negative initial reaction. Yet nearly everyone, whether teacher, parent, employer, or college student, has and believes his own theory of learning, even though he may not have stated it in so many words. [Kingsley and Garry, 1957, p. 82]

> It is easy enough to use one's chosen theory for explaining modifications in behavior as an instrument for describing growth; there are so many aspects of growth that any theory can find something that it can explain well. [Bruner, 1966, pp. 4-5]

And here is one of the rare examples of a straightforward attempt at a definition.

> In its scientific meaning, the term *theory* refers to a set of propositions inductively derived from empirical findings. Thus a scientific view of a theory of instruction would set forth a series of statements, based on sound replicable research, which would permit one to predict how particular changes in the educational setting would affect pupil behavior. [Thompson, 1970, p. 28]

But then we begin to run into some difficulties in distinguishing among models, paradigms, theoretical constructs, theorems and theories.

> Paradigms are models, patterns, or schemata. Paradigms are not theories; they are rather ways of thinking or patterns for research that, when carried out, can lead to the development of theory. . . .Generally, we use the term *theory* in a modest sense—to refer to any systematic ordering of ideas about the phenomena of a field of inquiry. We use the

term in antithesis to ad hoc, disorderly planning or interpretation of research, and in contrast to what has been called "dust-bowl empiricism," in which the investigator looks for facts wherever he may find them, with little prior consideration of where it may be most valuable to look and with little idea of how he will interpret what he finds. [Gage, 1972, pp. 73-82]

In science, a "theory" is a set of statements, including (a) general laws and principles that serve as axioms, (b) other laws, or theorems, that are deducible from the axioms, and (c) definitions of concepts. A "model" is structurally separate from a theory, but is functionally part of its axioms. . . .Any theory presupposes a more general model according to which the theoretical concepts are formulated. . . .The most general models, variously designated as "paradigms," "presuppositions," "world views," and "world hypotheses," have a pervasive influence throughout the more and more specific levels. The different levels of models are characterized by different degrees of generality, openness, and vagueness. . . .In the mechanistic world view, the model for all phenomena is the machine; in the organismic world view, the model is the biological organism and its activities. [Reese and Overton, 1970, p. 117]

We can now understand why the term "model" is sometimes used as a synonym for "theory," especially one which is couched in the postulational style. . . .In my opinion, this sort of usage of the term "model" is of dubious worth, methodologically speaking. If "model" is co-extensive with "theory," why not just say "theory," or if need be, "theory in postulational form?" In a strict sense, not all theories are in fact models: in general, we learn something about the subject-matter *from* the theory, but not by investigating properties *of* the theory. . .Consider, for instance, the difference between the theory of evolution and a model which a geneticist might construct to study mathematically the rate of diffusion in a hypothetical population of a characteristic with specified survival value. [Kaplan, 1964, pp. 264-265]

There are some psychologists who don't believe in theories at all. Gagne, for example, writes, "I do not think learning is a phenomenon which can be explained by simple theories, despite the admitted intellectual appeal that such theories have." [Gagne, 1965,

p. v] He goes on to explain, however, that a number of useful generalizations can be made about eight distinguishable classes of performance change which he describes as conditions of learning.

Skinner objects to theories on the score that the hypothesis-formulation-and-testing procedures they generate are wasteful and misleading. "They usually send the investigator down the wrong paths, and even if the scientific logic makes them self-correcting, the paths back are strewn with discarded theories." [Hilgard, 1966, p. 143] Skinner believes that the end result of scientific investigation is a "described functional relationship demonstrated in the data." After reviewing the classical theories he comes to the conclusion that "such theories are now of historical interest only, and unfortunately much of the work which was done to support them is also of little current value. We may turn instead to a more adequate analysis of the changes which take place as a student learns." [Skinner, 1968, p. 8]

Where does all this leave us in answering the question, What is a theory? Perhaps the only realistic answer is that a theory is what a given author says it is: if you want to understand his thinking you have to go along with his definitions. So here is mine: *A theory is a comprehensive, coherent, and internally consistent system of ideas about a set of phenomena.*

What Is Learning?

One of our most distinguished contemporary interpreters of learning theory, Ernest Hilgard, maintains that there is no basic disagreement about the definition of learning between the theories.

> While it is extremely difficult to formulate a satisfactory definition of learning so as to include all the activities and processes which we wish to include and eliminate all those which we wish to exclude the difficulty does not prove to be embarrassing because it is not a source of controversy as between theories. The controversy is over fact and interpretation, not over definition. [Hilgard and Bower, 1966, p. 6]

This generalization appears to hold as regards those learning theorists who dominated the field until recently, although there are

striking variations in the degree of precision among them. Let's start with three definitions by different authors in the same book. [Crow and Crow, 1963]

> Learning involves change. It is concerned with the acquisition of habits, knowledge, and attitudes. It enables the individual to make both personal and social adjustments. Since the concept of change is inherent in the concept of learning, any change in behavior implies that learning is taking place or has taken place. Learning that occurs during the process of change can be referred to as the *learning process*. [Crow and Crow, 1963]

> Learning is a change in the individual, due to the interaction of that individual, and his environment, which fills a need and makes him more capable of dealing adequately with his environment. [Burton, 1963, p. 7]

> There is a remarkable agreement upon the definition of learning as being reflected in a change in behavior as the result of experience. [Haggard, 1963, p. 20]

This last notion that we don't know what learning is directly, but can only infer it is supported by Cronbach's statement, "Learning is shown by a change in behavior as a result of experience." [Cronbach, 1963, p. 71] Harris and Schwahn go back to, "Learning is essentially change due to experience," but then go on to distinguish among *learning as product* (which emphasizes the end-result or outcome of the learning experience), *learning as process* (which emphasizes what happens during the course of a learning experience in attaining a given learning product or outcome), and *learning as function* (which emphasizes certain critical aspects of learning, such as motivation, retention, and transfer, which presumably make behavioral changes in human learning possible). [Harris and Schwahn, 1961, pp. 1-2]

Other definers take care to distinguish between planned learning and natural growth.

> Learning is a change in human disposition or capability, which can be retained, and which is not simply ascribable to the process of growth. [Gagne, 1965, p. 5]

> Learning is the process by which an activity originates or is changed through reacting to an encountered situation, provided that the characteristics of the change in activity cannot be explained on the basis of native response tendencies, maturation, or temporary states of the organism (e.g., fatigue, drugs, etc.) [Hilgard and Bower, 19[illegible] p. 2]

Two concepts lie at the heart of Skinner's treatment of learning: (1) *control* ("Recent improvements in the conditions which control behavior in the field of learning are of two principal sorts. The Law of Effect has been taken seriously; we have made sure that effects *do* occur under conditions which are optimal for producing changes called learning") and (2) *shaping* ("Once we have arranged the particular type of consequence called a reinforcement, our techniques permit us to shape the behavior of an organism almost at will"). [Skinner, 1968, p. 10]

It is clear that these learning theorists (and most of their precursors and many of their contemporaries) see learning as a process by which behavior is changed, shaped, or controlled. Other theorists prefer to define learning in terms of growth, development of competencies, and fulfillment of potential. Jerome Bruner, for example, observes, "It is easy enough to use one's chosen theory for explaining modifications in behavior as an instrument for describing growth; there are so many aspects of growth that any theory can find something that it can explain well." He then lists these "benchmarks about the nature of intellectual growth against which to measure one's efforts at explanation":

1. Growth is characterized by increasing independence of response from the immediate nature of the stimulus.
2. Growth depends upon internalizing events into a "storage system" that corresponds to the environment.
3. Intellectual growth involves an increasing capacity to say to oneself and others, by means of words or symbols, what one has done or what one will do.

4. Intellectual development depends upon a systematic and contingent interaction between a tutor and a learner.
5. Teaching is vastly facilitated by the medium of language, which ends by being not only the medium for exchange but the instrument that the learner can then use himself in bringing order into the environment.
6. Intellectual development is marked by increasing capacity to deal with several alternatives simultaneously, to attend to several sequences during the same period of time, and to allocate time and attention in a manner appropriate to these multiple demands. [Bruner, 1966, pp. 4-6]

Other theorists feel that even this emphasis on growth, with its focus on cognitive development, is too narrow to explain what learning is really about. Jones objects to Bruner's underemphasis on emotional skills; his exclusive attention to extra-psychic stimuli; the equating of symbolism with verbalism; and his preoccupation with the processes of concept attainment to the seeming exclusion of the processes of concept formation or invention. [Jones, 1968, pp. 97-104]

Nevertheless, Bruner is moving away from the perception of learning as a process of controlling, changing, or shaping behavior and putting it more in the context of competency-development. One of the most dynamic and prolific developments in the field of psychology, *humanistic psychology*, has recently exploded on the scene (the Association for Humanistic Psychology was founded in 1963) and has carried this trend of thought much farther. One of its exponents is Carl Rogers.

> Let me define a bit more precisely the elements which are involved in such significant or experiential learning. *It has a quality of personal involvement*—the whole person in both his feeling and cognitive aspects being *in* the learning event. *It is self-initiated.* Even when the impetus or stimulus comes from the outside, the sense of discovery, of reaching out, of grasping and comprehending, comes from within. *It is pervasive.* It makes a difference in the behavior, attitudes, perhaps even the personality of the learner. *It is evaluated by the learner.* He knows whether it is meeting his need, whether it leads toward what he *wants* to know,

> whether it illuminates the dark area of ignorance he is experiencing. The locus of evaluation, we might say, resides defintely in the learner. *Its essence is meaning*. When such learning takes place, the element of meaning to the learner is built into the whole experience. [Rogers, 1969, p. 5]

Maslow sees the goal of learning to be self-actualization, "... the full use of talents, capacities, potentialities, etc." [Maslow, 1970, p. 150] He conceives of growth toward this goal as being determined by the relationship of two sets of forces operating within each individual.

> One set clings to safety and defensiveness out of fear, tending to regress backward, hanging on to the past. ... The other set of forces impels him forward toward wholeness to Self and uniqueness of Self, toward full functioning of all his capacities .... We grow forward when the delights of growth and anxieties of safety are greater than the anxieties of growth and the delights of safety. [Maslow, 1972, pp. 44-45].

Building on the notion that "recent insights from the behavioral sciences have expanded the perception of human potential, through a re-casting of the image of man from a passive, reactive recipient, to an active, seeking, autonomous, and reflective being," Sidney Jourard develops the concept of *independent learning*.

> ... That independent learning is problematic is most peculiar, because man always and only learns by himself. ...Learning is not a task or problem; it is a way to be in the world. Man learns as he pursues goals and projects that have meaning for him. He is always learning something. Perhaps the key to the problem of independent learning lies in the phrase "the learner has the need and the capacity to assume responsibility for his own continuing learning." [Jourard, 1972, p. 66]

Other educational psychologists question the proposition that learning can be defined as a single process. For example, Gagne identifies five *domains of the learning process*, each with its own praxis.

(1) *Motor skills*, which are developed through practice.
(2) *Verbal information*, the major requirement for learning being its presentation within an organized, meaningful context.
(3) *Intellectual skills*, the learning of which appears to require prior learning of prerequisite skills.
(4) *Cognitive strategies*, the learning of which requires repeated occasions in which challenges to thinking are presented.
(5) *Attitudes*, which are learned most effectively through the use of human models and "vicarious reinforcement." [Gagne, 1972, pp. 3-4]

Tolman distinguished six "types of connections or relations" to be learned: (1) cathexes, (2) equivalence beliefs, (3) field expectancies, (4) field-cognition modes, (5) drive discriminations, and (6) motor patterns. [Hilgard and Bower, 1966, pp, 211-213]. Bloom and his associates identified three domains of educational objectives: (1) cognitive, "which deal with the recall or recognition of knowledge and the development of intellectual abilities and skills;" (2) affective, "which describe changes in interest, attitudes, and values, and the development of appreciations and adequate adjustment;" and (3) psychomotor. [Bloom, 1956, p. 7]

It is certainly clear by now that learning is an elusive phenomenon. And as we shall see next, the way one defines it greatly influences how he theorizes about it and how he goes about causing it to occur. Until recently educators of adults have been wallowing around in this same morass, and after wallowing around in it a bit more ourselves we'll see how adult-educators are beginning to extricate themselves.

theories of learning based on studies of animals and children

We know more about how animals (especially rodents and pigeons) learn than about how children learn: and we know much more about how children learn than about how adults learn. Perhaps this is because the study of learning was early taken over by experimental psychologists whose canons require a rigid control of variables. And it is obvious that the conditions under which animals learn are more controllable than those under which children learn; and the conditions under which children learn are much more controllable than those under which adults learn.

The fact is that all of the scientific theories of learning have been derived from the study of learning by animals and children.

Propounders and Interpreters

In general, there are two types of literature about learning theory: that produced by propounders of theories (who tend to be

dogmatic and argumentative), and that produced by interpreters of theories (who tend to be reconciliatory). Just so you'll have a perspective on this literature, I have extracted from the sources I have been studying a list of the major propounders and major interpreters and displayed them in Table 2.1. To provide a sense of historical development, they are listed more or less in the order of their appearance in the evolving body of literature. To keep the list within reasonable bounds, I have defined major as those who have made the greatest impact on the thinking of others as I sense the literature.

It must be admitted that the distinction between propounders and interpreters is not absolute. Some theorists, such as Pressey, Estes, Lorge, Gagne, Hilgard and Kuhlen, made contributions of both sorts, and have been placed in the column representing their major work. It is interesting to note that the bulk of the theory-production occurred in the first half of the century and that the bulk of the interpretation has appeared since 1950. Perhaps we have entered an era of integration.

Types of Theories

The proliferation of propounders has presented a major challenge to the interpreters in their quest to bring some sort of order into the system. In perhaps the most comprehensive interpretive work to date, Hilgard and Bower organize their review according to eleven categories.

Thorndike's Connectionism

Pavlov's Classical Conditioning

Guthrie's Contiguous Conditioning

Skinner's Operant Conditioning

Hull's Systematic Behavior Theory

Table 2-1
Propounders and Interpreters of Learning Theory

Propounders	Interpreters
Ebbinghaus (1885)	
Thorndike (1898)	
Angell (1896)	
Dewey (1896)	
Pavlov (1902)	
Woodworth (1906)	
Watson (1907)	
Judd (1908)	
Freud (1911)	
Kohler (1917)	
Tolman (1917)	
Wertheimer (1923)	
Koffka (1924)	Kilpatrick (1925)
Pressey (1926)	
Guthrie (1930)	Rugg (1928)
Skinner (1931)	Hilgard (1931)
Hall (1932)	
McGeoch (1932)	
Lewin (1933)	
Piaget (1935)	
Miller (1935)	
Spence (1936)	
Mowrer (1938)	
Katona (1940)	Bode (1940)
Maslow (1941)	Melton (1941)
Festinger (1942)	Cronbach (1943)
Rogers (1942)	Brunner (1943)
Estes (1944)	Lorge (1944)
Krech (1948)	
McClelland (1948)	
Sheffield (1949)	
Underwood (1949)	
Dollard (1950)	Schaie (1953)
Tyler (1950)	Garry (1953)

Table 2-1 continued

Propounders	Interpreters
	Koch (1954) McKeachie (1954) Birren (1954)
Bloom (1956) Bruner (1956) Erikson (1959) Crowder (1959) Lumsdaine (1959) Combs and Snygg (1959) Ausubel (1960) Glaser (1962) Gagne (1963)	Getzels (1956) Bugelski (1956) Kuhlen (1957) Kidd (1959) Botwinick (1960) Miller (1960) Glaser (1962) Flavell (1963)
	Hill (1963) Gage (1963) McDonald (1964)
Jourard (1964) Suchman (1964) Crutchfield (1969)	Goldstein (1965) Reese and Overton (1970) Goble (1971)

Tolman's Sign Learning

Gestalt Theory

Freud's Psychodynamics

Functionalism

Mathematical Learning Theory

Information Processing Models

They then share their frustration in arranging these disparate categories into a pattern.

> Learning theories fall into two major families: *stimulus-response* theories and *cognitive* theories, but not all theories belong to these two families. The stimulus-reponse theories include such diverse members as the theories of Thorndike, Pavlov, Guthrie, Skinner, and Hull. The cognitive theories include at least those of Tolman and the classical gestalt psychologists. Not completely and clearly classifiable in these terms are the theories of functionalism, psychodynamics, and the probabilistic theories of the model builders. The lines of cleavage between the two families of theories are not the only cleavages within learning theories: there are other specific issues upon which theories within one family may differ. [Hilgard and Bower, 1966, p. 8]

McDonald breaks the theories down into six categories in his analysis:

> Recapitulation (Hall)
>
> Connectionism (Thorndike)
>
> Pragmatism (Dewey)
>
> Gestalt and field theory (Ogden, Hartman, Lewin)
>
> Dynamic psychology (Freud)
>
> Functionalism (Judd) [McDonald, 1964, pp. 1-26].

Gage identifies three families of learning theories: (1) conditioning, (2) modeling, and (3) cognitive. [Gage, 1972, p. 19] Kingsley and Garry, two sets: (1) Association or stimulus-response (Thorndike, Guthrie, and Hull), and (2) field theories (Lewin, Tolman, and the gestalt psychologists). [Kingsley and Garry, 1957, p. 83] Taba agrees with the two-family set, but uses different labels: (1) associationist or behaviorist theories, and (2) organismic, gestalt, and field theories. [Taba, 1962, p. 80]

Obviously, the interpreters had not succeeded up to this point in organizing the field of learning theories in a really fundamental way—at least not in a way that satisfied most of them, and certainly not me. Then, in 1970, two developmental psychologists, Hayne W. Reese and Willis F. Overton, presented a way of conceptualizing the theories in terms of larger models, and the mist began to clear.

The Concept of Mechanistic and Organismic Models of Development

Reese and Overton start with the proposition, "Any theory presupposes a more general model according to which the theoretical concepts are formulated." The most general models are the world views or metaphysical systems which constitute basic models of the essential characteristics of man and indeed of the nature of reality. [Reese and Overton, 1970, p. 117]

Two systems which have been pervasive in both the physical and the social sciences are the *mechanistic* world view, the basic metaphor of which is the machine, and the *organismic* world view, the basic metaphor of which is the organism—the living, organized system presented to experience in multiple forms.

The *mechanistic model* represents the universe as a machine composed of discrete pieces operating in a spatio—temporal field. These pieces—elementary particles in motion—and their relations form the basic reality to which all other more complex phenomena are ultimately reducible. When forces are applied in the operation of the machine a chain-like sequence of events results; and, since these forces are the only immediate efficient or immediate causes of the events, complete prediction is possible—in principle. As Reese and Overton point out, "A further characteristic of the machine, and consequently of the universe represented in this way, is that it is eminently susceptible to quantification." [Ibid., p. 131]

When applied to the sphere of epistemology and psychology, this world view results in a *reactive*, passive, robot or empty-organism *model of man*. The organism is inherently at rest; activity is viewed as the resultant of external forces. Psychological functions, such as

thinking, willing, wishing, and perceiving, are seen as complex phenomena that are reducible to more simple phenomena by *efficient causes*. Change in the products or behavior of the organism is not seen as resulting from change in the structure of the organism itself.

> The appearance of qualitative changes is considered either as epiphenomenal (caused by another phenomenon) or as reducible to quantitative change, since the organism, like the elementary particles of classical physics, does not exhibit basic qualitative changes. [*Ibid.*, pp. 131-132]

The *organismic model* represents the universe as a unitary, interactive, developing organism. The essence of substance it perceives to be activity, rather than the static elementary particle proposed by the mechanistic model.

> From such a point of view, one element can never be like another, and as a consequence, the logic of discovering reality according to the analytical ideal of reducing the many qualitative differences to the one is repudiated. In its place is substituted a search for unity among the many; that is, a pluralistic universe is substituted for a monistic one, and it is the diversity which constitutes the unity. . .Thus, unity is found in multiplicity, being is found in becoming, and constancy is found in change. [*Ibid.*, p. 133]

The whole is therefore organic rather than mechanical in nature. "The nature of the whole, rather than being the sum of its parts, is presupposed by the parts and the whole constitutes the condition of the meaning and existence of the parts." [*Ibid.*] Accordingly, efficient cause is replaced by formal cause—cause by the essential nature of the form. Thus, the possibility of a predictive and quantifiable universe is precluded.

When applied to the sphere of epistemology and psychology, this world view results in an inherently and spontaneously *active organism model of man*. It sees man as an active organism rather than a reactive organism; as a *source* of acts, rather than as a collection of acts initiated by external forces. It also represents man as an organized entity.

> . . .a configuration of parts which gain their meaning, their function, from the whole in which they are imbedded. From this point of view, the concepts of psychological structure and function, or means and ends, become central rather than derived. Inquiry is directed toward the discovery off principles of organization, toward the explanation of the nature and relation of parts and wholes, structures and functions, rather than toward the derivation of these from elementary processes. [*Ibid.*, pp. 133-134]

> The individual who accepts this model will tend to emphasize the significance of processes over products, and qualitative change over quantitative change. . . . In addition, he will tend to emphasize the significance of the role of experience in facilitating or inhibiting the course of development, rather than the effect of training as the source of development. [*Ibid.*, p. 134]

With this and the preceding set of concepts as a frame of reference, let us turn to a brief examination of the theories about learning derived from the study of learning in animals and children.

Theories Based on a Mechanistic Model

The first systematic investigation in this country of the phenomenon we call learning was conducted by Edward L. Thorndike. It was a study of learning in animals, first reported in his *Animal Intelligence*, published in 1898.

Thorndike conceived learners to be empty organisms who responded to stimuli more or less randomly and automatically. A specific response is *connected* to a specific stimulus when it is rewarded. In this situation the stimulus, S, is entirely under the control of the experimenter (or teacher), and in large measure so is the response, R, for all the experimenter has to do to connect the particular R to a particular S is to reward the R when the organism happens to make it. This association between sense impressions and impulses to action came to be known as a bond or a connection. Thus, Thorndike's system has sometimes been called *bond psychology* or *connectionism*, and was the original stimulus-response (or S-R) psychology of learning.

Thorndike developed three laws which he believed governed the learning of animals and human beings: (1) the law of readiness (the circumstances under which a learner tends to be satisfied or annoyed, to welcome or to reject); (2) the law of exercise (the strengthening of connections with practice); and (3) the law of effect (the strengthening or weakening of a connection as a result of its consequences). In the course of a long and productive life (he died in 1949), and with help from many collaborators, both friendly and critical, Thorndike's system of thought became greatly refined and elaborated, and provided the subfoundation of the behaviorist theories of learning.

Soon after Thorndike started his work on connections in this country the Russian physiologist, Ivan Pavlov (1849-1936), inaugurated his experiments which resulted in the concept of conditioned reflexes. Hilgard describes his classical experiment.

> When meat powder is placed in a dog's mouth, salivation takes place; the food is the *unconditioned* stimulus and salivation is the *unconditioned* reflex. Then some arbitrary stimulus, such as a light, is combined with the presentation of the food. Eventually, after repetition and if time relationships are right, the light will evoke salivation independent of the food; the light is the *conditioned stimulus* and the response to it is the *conditioned reflex*. [Hilgard and Bower, 1966, p. 48]

Pavlov developed several concepts and accompanying techniques which have been incorporated into the behaviorist system. One was *reinforcement,* in which a conditioned reflex becomes fixed by following the conditioned stimulus repeatedly by the unconditioned stimulus and response at appropriate time intervals. Another was *extinction:* when reinforcement is discontinued and the conditioned stimulus is presented alone, unaccompanied by the unconditioned stimulus, the conditioned response gradually diminishes and disappears. Another was *generalization,* in which a conditioned reflex evoked to one stimulus can also be elicited by other stimuli, not necessarily similar to the first. A fourth basic concept was *differentiation,* in which the initial generalization is overcome by the method of contrasts in which one of a pair of stimuli is regularly

reinforced and the other is not; in the end, the conditioned reflex occurs only to the positive (reinforced) stimulus, and not to the negative (nonreinforced) stimulus. Pavlov's system has been termed *classical conditioning* to distinguish it from later developments in *instrumental conditioning* and *operant conditioning*.

John B. Watson (1878-1958) is generally credited with being the father of behaviorism.

> The behaviorists, then and now, had and have in common the conviction that a science of psychology must be based upon a study of that which is overtly observable: physical stimuli, the muscular movements and glandular secretions which they arouse, and the environmental products that ensue. The behaviorists have differed among themselves as to what may be inferred in addition to what is measured, but they all exclude self-observation. [Hilgard and Bower, 1966, p. 75]

Watson placed emphasis on kinesthetic stimuli as the integrators of animal learning, and, applying this concept to human beings, conjectured that thought was merely implicit speech—that sensitive enough instruments would detect tongue movements or other movements accompanying thinking.

Edwin R. Guthrie (1886-1959) built on the works of Thorndike, Pavlov, and Watson, and added the principle of contiguity of cue and response. His one law of learning, "from which all else about learning is made comprehensible," was stated as follows: "A combination of stimuli which has accompanied a movement will on its recurrence tend to be followed by that movement." [Hilgard and Bower, 1966, p. 77] In his later work, Guthrie placed increasing emphasis on the part played by the learner in selecting the physical stimuli to which it would respond; hence, the importance of the attention or *scanning* behavior that goes on before association takes place.

Guthrie's system of thought was further clarified and formalized by his students, Voeks and Sheffield, but the next major advance in behaviorist psychology was the result of the work of B.F. Skinner and his associates. It is from their work that the current educational technology of programmed instruction and teaching machines has

been derived. Rather than trying to summarize Skinner's rather complex system of thought in the text, I include as Appendix A a more detailed description of his ideas and their application to training by one of his advocates, John R. Murphy (it is also a good example of the sarcasm and name-calling used by advocates of one school of thought when referring to another school of thought, to which I alluded earlier).

Another development in behaviorist psychology occurring during the middle decades of the century was the construction of Clark L. Hull's *systematic behavior theory* and its elaboration by Miller, Mowrer, Spence and others. Hull's theory is a conceptual descendant of Thorndike's, inasmuch as he adopted reinforcement as an essential characteristic of learning. Hull constructed an elaborate "mathematico-deductive" theory revolving around the central notion that there are intervening variables in the organism which influence what response will occur following the onset of a stimulus. He developed sixteen postulates regarding the nature and operation of these variables, and stated them in such precise terms that they were readily subjected to quantitative testing. Hilgard's assessment of the effect of Hull's work follows.

> It must be acknowledged that Hull's system, for its time, was the best there was—not necessarily the one nearest to psychological reality, not necessarily the one whose generalizations were the most likely to endure—but the one worked out in the greatest detail, with the most conscientious effort to be quantitative throughout and at all points closely in touch with empirical tests. . . .Its primary contribution may turn out to lie not in its substance at all, but rather in the ideal it set for a genuinely systematic and quantitative psychological system far different from the *schools* which so long plagued psychology. [Hilgard and Bower, p. 187]

His work also no doubt stimulated the rash of mathematical models of learning which developed after 1950 by Estes, Burke, Bush, Mosteller and others—it should be pointed out that these are not themselves learning theories, but mathematical representations of substantive theories.

Appendix B presents a "Table of Behavioral Paradigms" in which Millenson summarizes the current status of thinking by the behaviorists regarding strategies for shaping behavior.

Theories Based on an Organismic Model

The first direct protest against the mechanistic model of the associationists was made by John Dewey in 1896. Although his work falls into the category of educational philosophy rather than learning theory, his emphasis on the role of interest and effort and on the child's motivation to solve his own problems became the starting point for a line of theorizing that has been given the label *functionalism*. Translated into schoolroom practices, functionalism provided the conceptual basis for progressive education, which, as Hilgard states, "at its best was an embodiment of the ideal of growth toward independence and self-control through interaction with an environment suited to the child's developmental level." [Hilgard and Bower, 1966, p. 299]

The spirit of experimentalism fostered by functionalism is reflected in the work of such learning theorists as Woodworth, Carr, McGeoch, Melton, Robinson, and Underwood. The flavor of functionalism is summarized by Hilgard.

1. The functionalist is tolerant but critical.
2. The functionalist prefers continuities over discontinuities or typologies.
3. The functionalist is an experimentalist.
4. The functionalist is biased toward associationism and environmentalism. [Hilgard and Bower, 1966, pp. 302-304].

Edward C. Tolman (1886-1959) in a sense represents a bridge between the mechanistic and the organismic models. His system was behavioristic in that he rejected introspection as a method for psychological science, but it was *molar* rather than *molecular* behaviorism—an act of behavior has distinctive properties all its own, to be identified and described irrespective of the muscular,

glandular, or neural processes that underlie it. But most importantly, he saw behavior as purposive—as being regulated in accordance with objectively determined ends. Purpose is, of course, an organismic concept. He rejected the idea that learning is the association of particular responses to particular stimuli. In contrast to the associationists, who believed that it is the response or sequence of responses resulting in reward that is learned, Tolman believed it is the route to the goal that is learned. He believed that organisms, at their respective levels of ability, are capable of recognizing and learning the relationships between signs and desired goals; in short, they perceive the significance of the signs. [Kingsley and Garry, 1957, p. 115] Tolman called his theory *purposive behaviorism*, but Hilgard referred to it as *sign learning* and Kingsley and Garry as *Sign-Gestalt-Expectation Theory*.

The most complete break with behaviorism occurred at the end of the first quarter of the century with the importation of the notion of *insight learning* in the gestalt theories of the Germans Wertheimer, Koffka, and Kohler. They took issue with the proposition that all learning consisted of the simple connection of responses to stimuli, insisting that experience is always structured, that we react not to just a mass of separate details, but to a complex pattern of stimuli. And we need to perceive stimuli in organized wholes, not in disconnected parts. The learner tends to organize his perceptual field according to four laws.

1. *The law of proximity*. The parts of a stimulus pattern that are close together or near to each other tend to be perceived in groups; therefore, the proximity of the parts in time and space affects the learners's organization of the field.
2. *The law of similarity and familiarity*. Objects similar in form, shape, color, or size, tend to be grouped in perception; and familiarity with an object facilitates the establishing of a figure-ground pattern. (Related to this law is the Gestaltists' view of memory as the persistence of *traces* in the brain which allows a carry-over from previous to present experiences. They view these traces not as static, but as modified by a continual process of integration and organization.

3. *The law of closure.* Learners try to achieve a satisfying end-state of equilibrium; incomplete shapes, missing parts, and gaps in information are filled in by the perceiver. (Kingsley and Garry observe that "closure is to Gestalt psychology what reward is to association theory") [1957, p. 109]
4. *The law of continuation.* Organization in perception tends to occur in such a manner that a straight line appears to continue as a straight line, a part circle as a circle, and a three-sided square as a complete square.

Gestalt psychology is classified by most interpreters as within the family of *field theories*—theories which propose that the total pattern or field of forces, stimuli, or events determine learning. Kurt Lewin (1890-1947) developed what he referred to specifically as a *field theory.* Using the topological concepts of geometry, Lewin conceptualized each individual as existing in a *life space* in which many forces are operating. The life space includes features of the environment to which the individual is reacting—material objects he encounters and manipulates, people he meets, and his private thoughts, tensions, goals, and fantasies. Behavior is the product of the interplay of these forces, the direction and relative strength of which can be portrayed by the geometry of vectors. Learning occurs as a result of a change in cognitive structures produced by changes in two types of forces: (1) change in the structure of the cognitive field itself, or (2) change in the internal needs or motivation of the individual. Because of its emphasis on the immediate field of forces, field theory places more emphasis on motivation than any of the preceding theories. Lewin felt that success was a more potent motivating force than reward, and gave attention to the concepts of ego-involvement and level of aspiration as forces affecting success. He saw change in the relative attractiveness of one goal over another, which he called *valence,* as another variable affecting motivation. Since some of the strongest forces affecting an individual's psychological field are other people, Lewin became greatly interested in group and institutional dynamics; and, as we shall see later, it is in this dimension of education that his strongest influence has been felt.

The most recent development in the field theoretical approach has appeared under several labels: phenomenological psychology, perceptual psychology, humanistic psychology, and third-force psychology. Since the bulk of the work with this approach has been with adults, major attention to it will be reserved for a later section. But two phenomenologists, Arthur Combs and Donald Snygg, have focused on the learning of children and the education of teachers of children so recently (1959) that their theories are not treated in most books on learning theory.

Since phenomenologists are concerned with the study of the progressive development of the mind—or, as our contemporaries would insist, the person—they see man as an organism forever seeking greater personal adequacy. The urge for self-actualization is the driving force motivating all of man's behavior.

> "The adequate personality is one that embodies positive percepts of self, a clearly developing concept of self, a growing acceptance of self and identification with others, and finally a rich, varied, available perceptive field of experience." [Pittenger and Gooding, 1971, p. 107]

The flavor of Combs and Snygg's system of thought can be caught from statements from Pittenger and Gooding, 1971.

- Man behaves in terms of what is real to him and what is related to his self at the moment of action. [p. 130]
- Learning is a process of discovering one's personal relationship to and with people, things, and ideas. This process results in and from a differentiation of the phenomenal field of the individual. [p. 136]
- Further differentiation of the phenomenological field occurs as an individual recognizes some inadequacy of a present organization. When a change is needed to maintain or enhance the phenomenal self, it is made by the individual as the right and proper thing to do. The role of the teacher is to facilitate the process. [p. 144]
- Given a healthy organism, positive environmental influences, and a nonrestrictive set of percepts of self, there appears to be no forseeable end to the perceptions possible for the individual [pp. 150-151]

- Transfer is a matter of taking current differentiations and using them as first approximations in the determination of the relationship of self to new situations. [p. 157]
- Learning is permanent to the extent that it generates problems that may be shared by others and to the degree that continued sharing itself is enhancing. [p. 165]

Two other contemporary psychologists, Piaget and Bruner, have had great impact on thinking about learning although they are not literally learning theorists. Their focus is on cognition and the theory of instruction. Piaget has conceptualized the process of the development of cognition and thought in evolutionary stages. According to him, the behavior of the human organism starts with the organization of sensory-motor reactions and becomes more intelligent as coordination between the reactions to objects becomes progressively more interrelated and complex. Thinking becomes possible after language develops—and with it a new mental organization. This development involves the following evolutionary periods:

1. *The formation of the symbolic or semiotic function* (ages two to seven or eight)—which enables the individual to represent objects or events that are not at the moment perceptible by evoking them through the agency of symbols or differentiated signs.
2. *The formation of concrete mental operations* (ages seven or eight to eleven or twelve)—linking and dissociation of classes, the sources of classification; the linking of relations; correspondences, etc.
3. *The formation of conceptual thought* (or formal operations) (ages eleven or twelve through adolescence)—"This period is characterized by the conquest of a new mode of reasoning, one that is no longer limited exclusively to dealing with objects or directly representable realities, but also employs 'hypotheses' . . ." [Piaget, 1970, pp. 30-33]

Some reservations have been expressed about the rigid age scale and minimization of individual differences in Piaget's schema, but

his conception of evolutionary stages adds a dimension that is not generally given much attention in the established learning theories.

Jerome Bruner has also been interested in the process of intellectual growth, and his benchmarks were described on pages 8 and 9. But his main interest has been in the structuring and sequencing of knowledge and translating this into a *theory of instruction*. But he does have a basic theory about the *act of learning*, which he views as involving three almost simultaneous processes: (1) acquisition of new information, often information that runs counter to or is a replacement of what the person has previously known, but which at the very least is a refinement of previous knowledge; (2) transformation, or the process of manipulating knowledge to make it fit new tasks; and (3) evaluation, or checking whether the way we have manipulated information is adequate to the task. [Bruner, 1960, pp. 48-49] We shall return to this theory of instruction in a later chapter.

The main criticism of Piaget, Bruner and other cognitive theorists by other adherents to the organismic model is that they are unbalanced in their over-emphasis on cognitive skills at the expense of emotional development; that they are preoccupied with the aggressive, agentic, and autonomous motives to the exclusion of the homonymous, libidinal, and communal motives; and that they concern themselves with concept attainment to the exclusion of concept formation or invention. [Jones, 1968, p. 97]

In recent years new frontiers have been opened in such learning-related fields of inquiry as *neurophysiology* (K.H. Pribram, G.A. Miller, J.F. Delafresnaye, H.F. Harlow, D.P. Kimble, W.G. Walter, D.E. Wooldridge, J.Z. Young); *mathematical modeling* (R.C. Atkinson, R.R. Bush, W.K. Estes, R.D. Luce, F. Restle); *information processing and cybernetics* (H. Borko, E.A. Feigenbaum, B.F. Green, W.R. Reitman, K.M. Sayre, M. Yovitts, J. Singh, K.O. Smith); *creativity* (J.P. Guilford, R.P. Crawford, J.E. Drevdahl, A. Meadow, S.J. Parnes, J.W. Getzels, P.W. Jackson); and *ecological psychology* (R.G. Barker, P.V. Gump, H.F. Wright, E.P. Willems, H.L. Raush). But to date these lines of investigation have resulted in knowledge that can be applied to existing theories about learning rather than producing comprehensive learning theories of their own.

theories of learning based on studies of adults

Another source of ideas about learning has been studies of the learning of adults—both mentally ill and healthy. In some cases the insights derived from these studies have been projected downward to inferences about the learning of children; in other cases, the investigators were concerned only with the adult learning. In all cases, the character and flavor of the theorizing has been quite different from that of the theories explored in the preceding chapter.

Contributions from Psychotherapy

It should perhaps not surprise anyone that the discipline that has contributed most to learning theory on the basis of work with adults has been psychotherapy. After all, psychotherapists are primarily concerned with re-education, and their subjects are overwhelmingly from the adult population.

Sigmund Freud (1856-1939) has influenced psychological thinking more than any other individual, but he did not formulate a

theory of learning per se. His major contribution was no doubt in revealing the influence of the subconscious mind on behavior. Such of his concepts as anxiety, repression, fixation, regression, aggression, defense mechanism, projection, identification, and transference, in blocking or motivating learning, have had to be taken into account by learning theorists. Freud was close to the behaviorists in his emphasis on the animalistic nature of man, but he saw him as a dynamic animal which grows and develops through the interaction of biological forces, goals and purposes, conscious and unconscious drives, and environmental influences—a conception more in keeping with the organismic model.

Other nonFreudian psychoanalysts—Jung, Adler, Alexander, Fromm, Horney, Sullivan—have made contributions to personality theory that have implications for learning.

But it is the clinical psychologists, especially those who identify themselves as *humanistic*, who have concerned themselves most deeply with problems of learning. The humanistic psychologists speak of themselves as "third force psychologists." In Goble's words, "By 1954 when Maslow published his book *Motivation and Personality*, there were two major theories dominant" in the behavioral sciences, Freudianism and behaviorism, in which "Freud placed the major motivational emphasis on deep inner drives (and) urges and the behaviorists placed the emphasis on external, environmental influences." But "like Freud and like Darwin before him, the Behaviorists saw man as merely another type of animal, with no essential differences from animals and with the same destructive, anti-social tendencies." [Goble, 1971, pp. 3-8]. Third force psychologists are concerned with the study and development of *fully functioning persons* (to use Rogers' term) or *self-actualizing persons* (to use Maslow's). They are critical of the atomistic approach common in physical science and among the behaviorists, breaking things down into their component parts and studying them separately.

> Most behavioral scientists have attempted to isolate independent drives, urges, and instincts and study them separately. This Maslow

found to be generally less productive than the holistic approach which holds that the whole is more than the sum of the parts. [*Ibid.*, p. 22].

Growth takes place when the next step forward is subjectively more delightful, more joyous, more intrinsically satisfying than the previous gratification with which we have become familiar and even bored; that the only way we can ever know that it is right for us is that it feels better subjectively than any alternative. The new experience validates *itself* rather than by any outside criterion. [Maslow, 1972, p. 43].

Maslow placed special emphasis on the role of safety, as becomes clear in the following formulation of the elements in the growth process:

1. The healthily spontaneous [person], in his spontaneity, from within out, reaches out to the environment in wonder and interest, and expresses whatever skills he has.
2. To the extent that he is not crippled by fear, to the extent that he feels safe enough to dare.
3. In this process, that which gives him the delight-experience is fortuitously encountered, or is offered to him by helpers.
4. He must be safe and self-accepting enough to be able to choose and prefer these delights, instead of being frightened by them.
5. If he can choose these experiences which are validated by the experience of delight, then he can return to the experience, repeat it, savor it to the point of repletion, satiation, or boredom.
6. At this point, he shows the tendency to go on to richer, more complex experiences and accomplishments in the same sector (if he feels safe enough to dare).
7. Such experiences not only mean moving on, but have a feedback effect on the Self, in the feeling of certainty ("This I like; that I don't for *sure*"); of capability, mastery, self-trust, self-esteem.
8. In this never ending series of choices of which life consists, the choice may generally be schematized as between safety (or, more broadly, defensiveness) and growth, and since only that [person] doesn't need safety who already has it, we may expect the growth choice to be made by the safety-need gratified [individual].
9. In order to be able to choose in accord with his own nature and to develop it, the [individual] must be permitted to retain the subjec-

tive experiences of delight and boredom, as *the* criteria of the correct choice for him. The alternative criterion is making the choice in terms of the wish of another person. The Self is lost when this happens. Also this constitutes restricting the choice to safety alone, since the [individual] will give up trust in his own delight-criterion out of fear (of losing protection, love, etc.).

10. If the choice is really a free one, and if the [individual] is not crippled, then we may expect him ordinarily to choose progression forward.
11. The evidence indicates that what delights the healthy [person], what tastes good to him, is also, more frequently than not, "best" for him in terms of far goals as perceivable by the spectator.
12. In this process the environment (parents, teachers, therapists) is important in various ways, even though the ultimate choice must be made by the individual.
    a. it can gratify his basic needs for safety, belongingness, love and respect, so that he can feel unthreatened, autonomous, interested, and spontaneous and thus dare to choose the unknown;
    b. it can help by making the growth choice positively attractive and less dangerous, and by making regressive choice less attractive and more costly.
13. In this way the psychology of Being and the psychology of Becoming can be reconciled, and the [person], simply being himself, can yet move forward and grow. [Maslow, 1972, pp. 50-51].

Carl R. Rogers, starting with the viewpoint that "in a general way, therapy is a learning process," [1951, p. 132] developed nineteen propositions for a theory of personality and behavior which were evolved from the study of adults in therapy [*Ibid.*, pp. 483-524] and then sought to apply them to education. This process led him to conceptualize *student-centered teaching* as parallel to *client-centered therapy* [*Ibid.*, pp. 388-391].

Rogers' student-centered approach to education was based on five "basic hypotheses," the first of which was: *We cannot teach another person directly; we can only facilitate his learning.* This hypothesis stems from the propositions in his personality theory that "Every individual exists in a continually changing world of experience of which he is the center," and "The organism reacts to the field as it is experienced and perceived." It requires a shift in focus

from what the teacher does to what is happening in the student.

His second hypothesis, *A person learns significantly only those things which he perceives as being involved in the maintenance of, or enhancement of, the structure of self.* This hypothesis underlines the importance of making the learning relevant to the learner, and puts into question the academic tradition of required courses.

Rogers grouped his third and fourth hypotheses together: *Experience which, if assimilated, would involve a change in the organization of self tends to be resisted through denial or distortion of symbolization,* and *The structure and organization of self appears to become more rigid under threat; to relax its boundaries when completely free from threat. Experience which is perceived as inconsistent with the self can only be assimilated if the current organization of self is relaxed and expanded to include it.* These hypotheses acknowledge the reality that significant learning is often threatening to an individual, and suggest the importance of providing an acceptant and supportive climate, with heavy reliance on student responsibility.

Rogers' fifth hypothesis extends the third and fourth to educational practice: *The educational situation which most effectively promotes significant learning is one in which (1) threat to the self of the learner is reduced to a minimum, and (2) differentiated perception of the field is facilitated.* He points out that the two parts of this hypothesis are almost synonymous, since differentiated perception is most likely when the self is not being threatened. (Rogers defined undifferentiated perception as an individual's "tendency to see experience in absolute and unconditional terms, to overgeneralize, to be dominated by concept or belief, to fail to achor his reactions in space and time, to confuse fact and evaluation, to rely on ideas rather then upon reality-testing," in contrast to differentiated perception as the tendency" to see things in limited, differentiated terms, to be aware of the space-time anchorage of facts, to be dominated by facts, not concepts, to evaluate in multiple ways, to be aware of different levels of abstraction, to test his inferences and abstractions by reality, in so far as possible." [*Ibid.*, p. 144]).

Rogers sees learning as a completely internal process controlled

by the learner and engaging his hole being in interaction with his environment as he perceives it. But he also believes that learning is as natural—and required—a life process as breathing. His Proposition IV states: *The organism has one basic tendency and striving—to actualize, maintain, and enhance the experiencing organism.* [*Ibid.*, p. 497]. This central premise is well summarized in the following statement:

> Clinically I find it to be true that though an individual may remain dependent because he has always been so, or may drift into dependence without realizing what he is doing, or may temporarily wish to be dependent because his situation appears desperate, I have yet to find the individual who, when he examines his situation deeply, and feels that he perceives it clearly, deliberately chooses dependence, deliberately chooses to have the integrated direction of himself undertaken by another. When all the elements are clearly perceived, the balance seems invariably in the direction of the painful but ultimately rewarding path of self-actualization and growth. [*Ibid.*, p. 490].

Both Maslow and Rogers acknowledge their affinity with the work of Gordon Allport (1955, 1960, 1961) in defining growth not as a process of "being shaped," but a process of becoming. The essence of their conception of learning is captured in this brief statement by Rogers:

> "I should like to point out one final characteristic of these individuals as they strive to discover and become themselves. It is that the individual seems to become more content to be a *process* rather than a *product*." [1961, p. 122].

Contributions from Adult Education

Most scholars in the field of adult education itself have dealt with the problem of learning by trying to adapt theories about child learning to the "differences in degree" among adults. (For example, Brunner, 1959; Kidd, 1959; Kempfer, 1955; Verner and Booth, 1964). Howard McClusky has followed this line for the most part, but has begun to map out directions for the development of a "differential psychology of the adult potential" in which the con-

cepts of *margin* (the power available to a person over and beyond that required to handle his load), *commitment, time perception, critical periods,* and *self concept* are central. A summary of McClusky's emergent theory is presented in Appendix C, which you may wish to turn to at this point.

Cyril O. Houle began a line of investigation in the 1950's at the University of Chicago that has been carried on and extended by Allen Tough at the Ontario Institute for Studies in Education which promises to yield better understanding about the process of adult learning. Their approach was a study through in-depth interviews of a small sample of adults who were identified as *continuing learners.*

Houle's study of twenty-two subjects was designed to discover primarily *why* adults engage in continuing education, but it sheds some light also on *how* they learn. Through an involved process of the analysis of the characteristics uncovered in the interviews, he found that his subjects could be fitted into three categories. As Houle points out, "These are not pure types; the best way to represent them pictorially would be by three circles which overlap at their edges. But the central emphasis of each subgroup is clearly discernible." [Houle, 1961, p. 16]. The criterion for typing the individuals into subgroups was the major conception they held about the purposes and values of continuing education for themselves. The three types are:

1. The *goal-oriented* learners, who use education for accomplishing fairly clear-cut objectives. These individuals usually did not make any real start on their continuing education until their middle twenties and after—sometimes much later.

> "The continuing education of the goal-oriented is in episodes, each of which begins with the realization of a need or the indentification of an interest. There is no even, steady, continuous flow to the learning of such people, though it is an ever-recurring characteristic of their lives. Nor do they restrict their activities to any one institution or method of learning. The need or interest

appears and they satisfy it by taking a course, or joining a group, or reading a book or going on a trip." [*Ibid.*, p. 18]

2. The *activity-oriented*, who take part because they find in the circumstances of the learning a meaning which has no necessary connection—and often no connection at all—with the content or the announced purpose of the activity. These individuals also begin their sustained participation in adult education at the point when their problems or their needs become sufficiently pressing.

> All of the activity-oriented people interviewed in this study were course-takers and group-joiners. They might stay within a single institution or they might go to a number of different places, but it was social contact that they sought and their selection of any activity was essentially based on the amount and kind of human relationships it would yield. [*Ibid.*, pp. 23-24.]

3. The *learning-oriented*, who seek knowledge for its own sake. Unlike the other types, most learning-oriented adults have been engrossed in learning as long as they can remember.

> What they do has a continuity, a flow and a spread which establish the basic nature of their participation in continuing education. For the most part, they are avid readers and have been since childhood; they join groups and classes and organizations for educational reasons; they select the serious programs on television and radio; when they travel . . . they make a production out of it, being sure to prepare adequately to appreciate what they see; and they choose jobs and make other decisions in life in terms of the potential for growth which they offer. [*Ibid.*, pp. 24-25]

Tough's investigation was concerned not only with what and why adults learn, but how they learn and what help they obtain for learning. Tough found that adult learning is a very pervasive activity.

> Almost everyone undertakes at least one or two major learning efforts a year, and some individuals undertake as many as 15 or

> 20 . . . . It is common for a man or woman to spend 700 hours a year at learning projects . . . About 70% of all learning projects are planned by the learner himself, who seeks help and subject matter from a variety of acquaintances, experts, and printed resources. [Tough, 1971, p. 1].

Tough found that his subjects organized their learning efforts around "projects . . . defined as a series of related episodes, adding up to at least seven hours. In each *episode* more than half of the person's total motivation is to gain and retain certain fairly clear knowledge and skill, or to produce some other lasting change in himself." [*Ibid.*, p. 6].

He found that in some projects the episodes may be related to the desired knowledge and skill. For example, the learner may want to learn more about India: in one episode he reads about the people of India; in another episode he discusses the current economic and political situation with an Indian graduate student; in a third he watches a television program describing the life of an Indian child. Or the episodes can also be related by the use to which the knowledge and skill will be put: one person might engage in a project consisting of a number of learning experiences to improve his competence as a parent; another project might consist of episodes aimed at obtaining the knowledge and skill necessary for building a boat.

Tough was interested in determining what motivated adults to begin a learning project, and found that overwhelmingly his subjects anticipated several desired outcomes and benefits to result, as summarized in Figure 3-1. Some of the benefits are immediate: satisfying a curiosity, enjoying the content itself, enjoying practicing the skill, enjoying the activity of learning; others are long-run: producing something, imparting knowledge or skill to others, understanding what will happen in some future situation, etc. Clearly pleasure and self-esteem were critical elements in the motivation of Tough's subjects.

Tough came to the conclusion that an adult learner proceeds through several phases in the process of engaging in a learning project, and speculated that helping them gain increased competence in

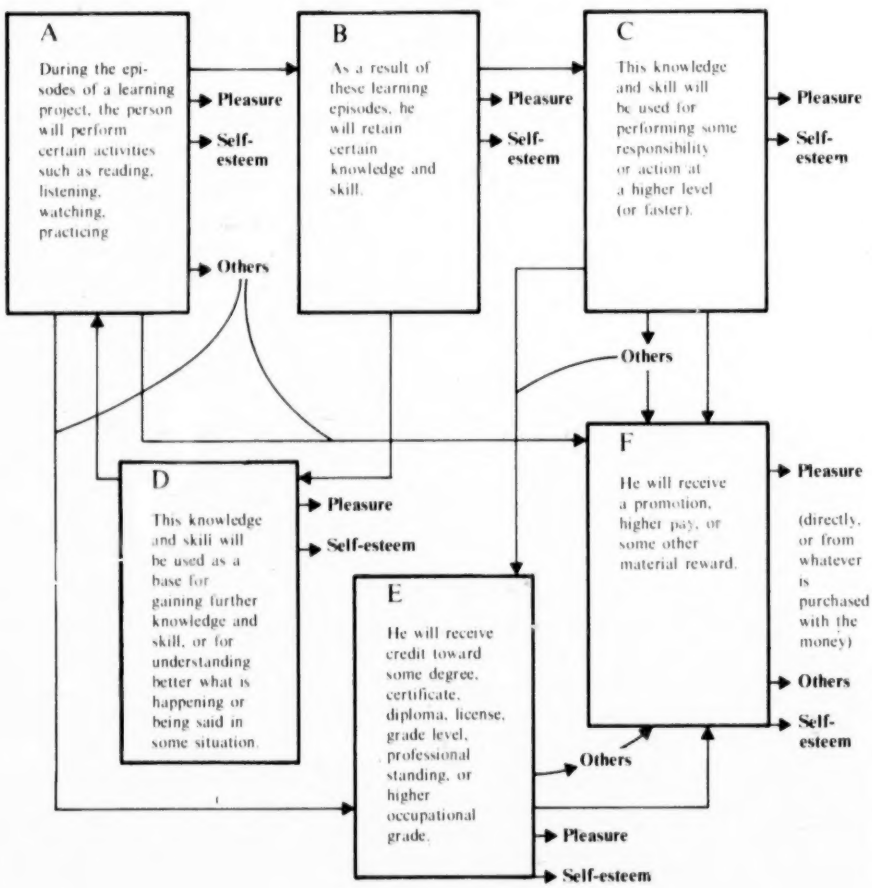
A
During the episodes of a learning project, the person will perform certain activities such as reading, listening, watching, practicing
Pleasure
Self-esteem
Others
B
As a result of these learning episodes, he will retain certain knowledge and skill.
Pleasure
Self-esteem
C
This knowledge and skill will be used for performing some responsibility or action at a higher level (or faster).
Pleasure
Self-esteem
Others
D
This knowledge and skill will be used as a base for gaining further knowledge and skill, or for understanding better what is happening or being said in some situation.
Pleasure
Self-esteem
E
He will receive credit toward some degree, certificate, diploma, license, grade level, professional standing, or higher occupational grade.
Others
Pleasure
Self-esteem
F
He will receive a promotion, higher pay, or some other material reward.
Pleasure
(directly, or from whatever is purchased with the money)
Others
Self-esteem

Figure 3-1. The relationships among the benefits that a learner may expect from a learning project. [Tough, 1971] p. 47.

dealing with each phase might be one of the most effective ways of improving their learning effectiveness.

The first phase is deciding to begin, in which Tough identified twenty-six possible steps the learner might take, including setting an action goal, assessing his interests, seeking information on certain opportunities, choosing the most appropriate knowledge and skill, establishing a desired level of amount, and estimating the costs and benefits.

A second phase is choosing the planner, which may be himself, an object (e.g., programmed text, workbook, tape recordings), an individual *learning consultant* (instructor, counselor, resource person), or a group. Competence in choosing a planner and using him *proactively* rather than *reactively*, collaboratively rather than dependently, were found to be crucial in this phase.

Finally, the learner engages in learning episodes sketched out in the planning process, the critical elements here being the variety and richness of the resources, their availability and the learner's skill in making use of them.

Tough emerged from his study with this challenging vision regarding future possibilities in adult learning:

> The last 20 years have produced some important new additions to the content of adult learning projects. Through group and individual methods, many adults now set out to increase their self-insight, their awareness and sensitivity with other persons and their interpersonal competence. They learn to "listen to themselves," to free their body and their conversations from certain restrictions and tensions, to take a risk, to be open and congruent. Attempting to learn this sort of knowledge and skill seemed incredible to most people 20 years ago. Great changes in our conception of what people can and should set out to learn have been created by T-groups, the human potential movement, humanistic psychology, and transpersonal psychology.
>
> Perhaps the next 20 years will produce several important additions to what we try to learn. In 1990, when people look back to our conception of what adults can learn, will they be amused by how narrow it is? [Tough, 1971, p. 42].

An Andragogical Theory of Adult Learning

For over two decades I have been trying to formulate a theory of adult learning that takes into account what we know from experience and research about the unique characteristics of adult learners. Originally (*Informal Adult Education*, 1950) I organized my ideas around the concept of informal adult education. Then, in the mid-1960's I became exposed to the term *andragogy*, used by my adult educational colleagues in Yugoslavia, which seemed a more adequate organizing concept.

I should like to present it at this point, to be examined in the same stream of thought, and with the same weight as the preceding theoretical formulations. In order to avoid any loading of the dice, I shall present it in a form adapted from an address made at the 18th Annual Program Meeting of the Council on Social Work Education in Seattle, Washington, January, 1971. Where appropriate, however, I will include diagrams and citations from other authors which were not given in the address. The meeting is called to order:

> The New Wave sweeping education into the 1970s is a humanistic quest for an understanding of the complex dynamics of growth and development by unique individuals in interaction with their environments. In this quest, all sources of knowledge and insight are honored, including intuition, artistic experience, introspection, analytical case histories, action-research, and controlled experimentation. Speculative theory-building is respected as a stimulus to more significant knowledge-discovery. Though this clashes with the era of scientism of the 1960s, we are gaining a new appreciation of the learning process.

*"Innovations in Teaching Styles and Approaches Based on Adult Learning," *Journal of Education for Social Work*, Vol. 8, No. 2 (Spring, 1972), 39.

Innovative Processes, Not Gimmicks

In discussing innovations in teaching, I am talking not about gimmicks, devices, instruments, tools, and techniques for patching up what is basically an unsound educational system, but about innovative theories and processes of learning. Perhaps in the past generation it was functional to think of the improvement of education in terms of discovering and developing some new techniques for making it more interesting, more relevant, and even more participative. But I think that we have now moved into a more sophisticated era of thinking about learning, in which we have to talk about more fundamental things if we want to improve education—particularly professional education. We can no longer afford the luxury of enjoying such multimillion-dollar fads as programmed instruction, packaged didactic learning systems, and airborne canned television instruction programs, as we did in the 1950s and 1960s. We have finally really begun to absorb into our culture the ancient insight that the heart of edducation is learning, not teaching, and so our focus has started to shift from what the teacher does to what happens to the learners.

Our Progressively Regressive Educational System

I propose that our traditional educational system is progressively regressive. The best education—the procedures for helping people learn which are most congruent with what we now know about the learning process—takes place in the nursery school and kindergarten, and it tends to get progressively worse on climbing up the educational ladder, reaching its nadir in college. This is because the forces at work on learners from about the second grade on have very little to do with learning. Most of them have to do with achieving—passing tests, scoring high on SATs, getting into college (or graduate school), or qualifying for a job. Fortunately, some of the new biology, new social studies, new linguistics , which engage students in learning through inquiry, are spreading through secondary education. However, they haven't yet made much headway in higher education, and it is my observation that the theory and technology on which most of our graduate education (including social work education) is based are at least a generation behind what we now know about learning.

The Millstone of Pedagogy

I believe that the cultural lag in education can be explained by the fact that we got hemmed in from the beginning of the development of our educational system by the assumptions about learning that were made when the education of children became organized in the Middle Ages. Pedagogy became a millstone around education's neck. Tragically, the earlier traditions of teaching and learning were aborted and lost with the fall of Rome; for all the great teachers of ancient history—Lao Tse and Confucius in China, the Hebrew prophets, Jesus, Socrates, Plato, Aristotle, Euclid, Cicero, Quintilian—were chiefly teachers of adults, not children. And they made assumptions about learning (such as that learning is a process of discovery by the learner) and used procedures (dialogue and "learning by doing") that came to be labelled "pagan" and were therefore forbidden when monastic schools started being organized in the seventh century. As novices were received into the monasteries to prepare for a monastic life, it was necessary that they be taught to read and write if they were later to use and transcribe the sacred books. The teaching monks based their instruction on assumptions about what would be required to control the development of these children into obedient, faithful, and efficient servants of the church.

From this origin developed the tradition of *pedagogy*, which later spread to the secular schools of Europe and America and, unfortunately, was much later applied even to the education of adults. Let me point out that "pedagogy" comes from the same stem as "pediatrics"—the Greek work "*paid*," meaning child (plus "*agogus*," meaning leader of). So, literally, pedagogy, means the art and science of teaching children. So to speak of "the pedagogy of adult education" is a contradiction in terms. Yet, haven't most adults—including people in professional training—been taught as if they were children?

People who have been working primarily in the education of adults, where no degree is involved and where attendance is voluntary, have known for a long time that they had to violate some of the assumptions and concepts of pedagogy if they were to help—and keep—their students. But they have felt guilty because it meant departing from accepted academic stanndards. In the last decade, however, their guilt feelings have begun to disappear, largely because there has been emerg-

ing a new, coherent, comprehensive body of theory and technology based on assumptions about adults as learners. Thus they are now getting a respectable rationale for doing what they have known all along would result in better learning.

This new theory is going under the label "andragogy," derived from the stem of the Greek word "aner," meaning man (as distinguished from boy). This is not a new word; it was used in Germany as early as 1833 and has been used extensively during the last decade in Yugoslavia, France, and Holland (in 1970 the University of Amsterdam established a "Department of Pedagogical and Andragogical Sciences"). But the theory and technology it is coming to identify are new.

I am not talking about a clear-cut differentiation between children and adults as learners. Rather, I am differentiating between the *assumptions* about learners that have traditionally been made by those who practice pedagogy in contrast to the assumptions made in andragogy. I believe that the assumptions of andragogy apply to children and youth as they mature, and that they, too, will come to be taught more and more andragogically.

Let me elaborate on this last point a bit. I speculate, with growing support from research [see Bruner, 1961; Erikson, 1950, 1959, 1964; Getzels and Jackson, 1962; Bower and Hollister, 1967; Iscoe and Stevenson, 1960; White, 1959] that as an individual matures, his *need* and *capacity* to be self-directing, to utilize his experience in learning, to identify his own readinesses to learn, and to organize his learning around life problems, increases steadily from infancy to pre-adolescence, and then increasingly rapidly during adolescence.

In Figure 2 this rate of natural maturation is represented as a decrease in dependency, as represented by the solid line. Thus, pedagogical assumptions are realistic—and pedagogy is practiced appropriately—because of the high degree of dependency during the first year, but they become decreasingly appropriate in the second, third, fourth, and so on, years—as represented by the area with the vertical lines. But it is my observation that the American culture (home, school, religious institutions, youth agencies, governmental systems) assumes—and therefore permits—a growth rate that is

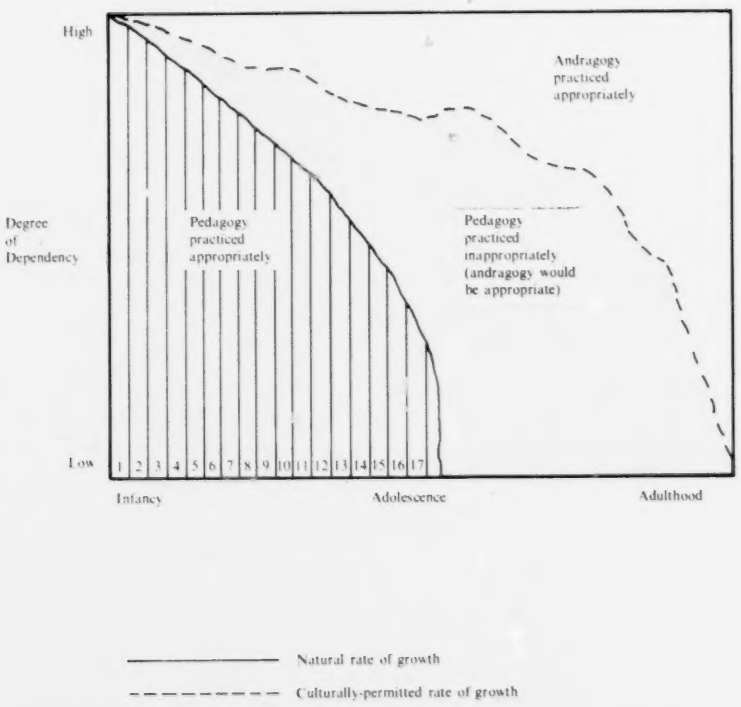

Figure 3-2. The natural maturation toward self-direction as compared with the culturally-permitted rate of growth of self-direction.

much slower, as represented by the broken line. Accordingly, pedagogy is practiced increasingly inappropriately as represented by the shaded area between the solid and broken lines. The problem is that the culture does not nurture the development of the abilities required for self-direction, while the need to be increasingly self-directing continues to develop organically. The result is a growing gap between the need and the ability to be self-directing, and this

produces tension, resistance, resentment, and often rebellion in the individual.

The Assumptions of Andragogy

Andragogical theory is based on at least four main assumptions that are different from those of pedagogy:

1. *Changes in self-concept.*

This assumption is that as a person grows and matures his self-concept moves from one of total dependency (as is the reality of the infant) to one of increasing self-directedness.

Andragogy assumes that the point at which an individual achieves a self-concept of essential self-direction is the point at which he psychologically becomes adult. A very critical thing happens when this occurs: the individual develops a deep psychological need to be perceived by others as being self-directing. Thus, when he finds himself in a situation in which he is not allowed to be self-directing, he experiences a tension between that situation and his self-concept. His reaction is bound to be tainted with resentment and resistance.

It is my own observation that those students who have entered a professional school or a job have made a big step toward seeing themselves as essentially self-directing. They have largely resolved their identity-formation issues; they are identified with an adult role. Any experience that they perceive as putting them in the position of being treated as children is bound to interfere with their learning.

2. *The role of experience.*

This assumption is that as an individual matures he accumulates an expanding reservoir of experience that causes him to become an increasingly rich resource for learning, and at the same time provides him with a broadening base to which to relate new learnings. Accordingly, in the technology of andragogy there is decreasing emphasis on the

transmittal techniques of traditional teaching and increasing emphasis on experiential techniques which tap the experience of the learners and involve them in analyzing their experience. The use of lectures, canned audio-visual presentations, and assigned reading tend to fade in favor of discussion, laboratory, simulation, field experience, team project, and other action-learning techniques

There is another, more subtle reason for emphasizing the utilization of the experience of the learners. A young child identifies himself largely in terms of external definers—who his parents, brothers, and sisters are, where he lives, and to what school and church he goes. As he matures, he increasingly defines who he is by his experience. To a child, experience is something that happens to him; to an adult, his experience is *who he is*. So in any situation in which an adult's experience is being devalued or ignored, the adult perceives this as not rejecting just his experience, but rejecting him as a person. Andragogues convey their respect for people by making use of their experience as a resource for learning.

Recent studies of cognitive changes in the adult years [Flavell, 1970; Botwinick, 1967; Jones, 1959] give evidence that both programmed experiences (psychotherapy, adult education) and unprogrammed experiences (marriage, child rearing, occupational activities) produce deep-seated changes in the ways adults approach problems, handle risk and organize their thinking. Thus, differences in *cognitive styles* [Hill and Nunney, 1971] have to be increasingly taken into account. If individual differences are important in dealing with children, they are more important in dealing with adults, because they widen with experience. A group of fifty-year-olds is more different from one another than a group of forty-year-olds, who in turn, are more differentiated than a group of ten-year-olds.

3. *Readiness to learn.*

This assumption is that as an individual matures, his readiness to learn is decreasingly the product of his biological development and academic pressure and is increasingly the product of the developmental tasks required for the performance of his evolving social roles. In a sense,

pedagogy assumes that children are ready to learn those things they "ought" to because of their biological and academic development, whereas andragogy assumes that learners are ready to learn those things they "need" to because of the developmental phases they are approaching in their roles as workers, spouses, parents, organizational members and leaders, leisure time users, and the like.

The critical implication of this assumption is the importance of timing learning experiences to coincide with the learners' developmental tasks. It is my observation that a good deal of professional education is totally out of phase with the students' readiness to learn. For example, a new medical student needs to have direct experience with hospitals, patients, and practicing doctors before he is ready to learn facts about pathology, anatomy, biochemistry, and other content. And the new social work student needs to have some direct experience with clients with problems before he is ready to learn about public welfare legislation and policy, case work principles and techniques, theory and practice of administration, concepts of community organization, group work, and research methods. He'll be ready to inquire into these areas of content as he confronts problems to which they are relevant. [*Ibid.*]

It is by no means assumed that one has to sit passively by and wait for readiness to develop naturally. There are ways to stimulate it through exposure to better models of performance, higher levels of aspiration and self-diagnostic procedures. David McClelland has developed a highly successful set of strategies for helping adults develop what he calls *Achievement* motives. [McClelland, 1970].

4. *Orientation to learning.*

This assumption is that children have been conditioned to have a subject-centered orientation to most learning, whereas adults tend to have a problem-centered orientation to learning. This difference is primarily the result of the difference in time perspective. The child's time perspective toward learning is one of postponed application. For example, most of what I learned in grade school had little to do with my functioning better as a preadolescent; I learned it in order to be able to get into high school. What I learned in high school, I learned in order to

qualify for college. And what I learned in college was learned in order to be able to get a job and be able to make my way as an adult.

The adult, on the other hand, comes into an educational activity largely because he is experiencing some inadequacy in coping with current life problems. He wants to apply tomorrow what he learns today, so his time perspective is one of immediacy of application. Therefore, he enters into education with a problem-centered orientation to learning.

This assumption has major implications regarding the organization of the curriculum and its learning experiences. If the assumption is accepted that the learners are subject-centered in their orientation to learning, it follows that the curriculum should be organized according to the logic of the subject matter and that the course units should be defined by the logical sequence of content topics. According to this line of reasoning, it would make sense for first-year social work students to acquire basic foundational knowledge about the field—history, philosophy, public policy, institutional structure, etc.; for second-year students to focus on the theory and principles of social work practice; and for third-year students to concentrate on skill development and field experience.

But this approach doesn't make any sense at all when working with mature people who are problem-centered in their orientation to learning. At best they would see the first two years to be drudgery that has to be endured in order to get to the "real thing" in the third year. They would see as much more relevant a curriculum that is organized around the problem areas with which social work deals, perhaps with a different but sequential set of problems each year, and with the sequence of learning within each unit being from field experience to theory and principles to foundational knowledge to skill practice to field application. When we reorganized our graduate program in adult education at Boston University around problem areas I was amazed at the difference in spirit with which the students entered problem-centered units in contrast to their feelings about subject-centered units. Their ego-involvement increased to the point that other professors started complaining about my assigning my students so much work that they didn't have time to do the assignments in their other courses (and I have never assigned a page of required reading in my teaching career). [*Ibid.*]

This assumption is strongly supported by the studies of adults' time perspective described by McClusky in Appendix C and by Tough's studies of adult learning projects described earlier [pp. 36-39]. In fact, I now prefer Tough's concept of learning projects as a basis of organizing adult educational programs to my earlier concept of problem areas.

theories of teaching

Principles of Teaching from Theories of Learning

Theories of learning are of use only to laboratory scientists unless they are applied somehow to the facilitation of learning, a function assigned usually in our society to a person designated as teacher.

> A distinction can be made between theories of learning and theories of teaching. While theories of learning deal with the ways in which an organism learns, theories of teaching deal with the ways in which a person influences an organism to learn. [Gage, 1972, p. 56]

Presumably, the learning theory subscribed to by a teacher will influence his theory of teaching.

> Teaching becomes the process of providing for the learner what a given learning theory regards as essential. For the conditioning theorists, the teacher must provide cues for a given response and reinforcement of that response. For the modeling theorist, the teacher must provide a model to be observed and imitated. For the cognitive theorist, the teacher must provide a cognitive structure or the stimuli that will produce one. [Gage, 1972, p. 19]

Gage apparently didn't recognize humanistic theorists.

Hilgard, resisting this fragmentation of learning theory, has identified twenty principles from three different families of theories—S-R theory, cognitive theory, and motivation and personality theory—which are potentially useful:

A. *Principles emphasized in S-R theory*
   1. The learner should be *active*, rather than a passive listener or viewer.
   2. *Frequency of repetition* is still important in acquiring skill, and for retention through overlearning.
   3. *Reinforcement* is important; that is, in repetition desirable or correct responses should be rewarded.
   4. *Generalization* and *discrimination* suggest the importance of practice in varied contexts, so that learning will become (or remain) appropriate to a wider (or more restricted) range of stimuli.
   5. *Novelty* in behavior can be enchanced through imitation of models, through cueing, through shaping, and is not inconsistent with a liberalized S-R approach.
   6. *Drive* is important in learning, but all personal-social motives do not conform to the drive-reduction principles based on food-deprivation experiments.
   7. *Conflicts* and *frustrations* arise inevitably in the process of learning difficult discriminations and in social situations in which irrelevant motives may be aroused. Hence we must recognize and provide for their resolution or accommodation.

B. *Principles emphasized in cognitive theory*
   1. The *perceptual features* of the problem given the learner are important conditions of learning—figure-ground relations, directional signs, sequence, organic interrelatedness. Hence a learning problem should be so structured and presented that the essential features are op[illegible] the inspection of the learner.
   2. The *organization of knowledge* should be an essential concern of the teacher or educational planner so that the direction from simple to complex is *not* from arbitrary, meaningless parts to meaningful wholes, but instead from *simplified wholes* to *more complex wholes*.
   3. Learning is *culturally relative*, and both the wider culture and

the subculture to which the learner belongs may affect his learning.

4. *Cognitive feedback* confirms correct knowledge and corrects faulty learning. The learner tries something provisionally and then accepts or rejects what he does on the basis of its consequences. This is, of course, the cognitive equivalent of reinforcement in S-R theory, but cognitive theory tends to place more emphasis upon a kind of hypothesis-testing through feedback.
5. *Goal-setting* by the learner is important as motivation for learning and his successes and failures determine how he sets future goals.
6. *Divergent thinking*,which leads to inventive problem solving or the creation of novel and valued products, is to be nurtured along with *convergent* thinking, which leads to logically correct answers.

C. *Principles from motivation and personality theory*

1. The learner's *abilities* are important, and provisions have to be made for slower and more rapid learners, as well as for those with specialized abilities.
2. *Postnatal development* may be as important as hereditary and congenital determiners of ability and interest. Hence the learner must be understood in terms of the influences that have shaped his development.
3. Learning is *culturally relative*, and both the wider culture and the subculture to which the learner belongs may affect his learning.
4. *Anxiety level* of the individual learner may determine the beneficial or detrimental effects of certain kinds of encouragements to learn.
5. The same objective situation may tap *appropriate motives* for one learner and not for another, as for example, in the contrast between those motivated by affiliation and those motivated by achievement.
6. The *organization of motives* and values within the individual is relevant. Some long-range goals affect short-range activities. Thus college students of equal ability may do better in courses perceived as relevant to their majors than in those perceived as irrelevant.
7. The *group atmosphere* of learning (competition vs cooperation, authoritarianism vs democracy, individual isolation vs group

identification) will affect satisfaction in learning as well as the products of learning. [Hilgard and Bower, 1966, pp. 562-564]

One reason for Hilgard's confidence that his twenty principles would be "in large part acceptable to all parties" is that he limits the "parties" with whom he checks them out to control-oriented theorists. In spite of their differences about the internal mechanics of learning, they are fairly close in their conceptualization of the role of the teacher.

Concepts of Teaching Derived from Theories of Learning of Animals and Children

Let's examine the concepts of a variety of theorists about the nature of teaching and the role of the teacher. First, the members of Hilgard's jury.

Thorndike saw teaching essentially as the control of learning by the management of reward. The teacher and learner must know the characteristics of a good performance in order that practice may be appropriately arranged. Errors must be diagnosed so that they will not be repeated. The teacher is not primarily concerned with the internal states of the organism, but instead with structuring the situation so that rewards will operate to strengthen desired responses. The learner should be interested, problem-oriented and attentive. However, the best way to obtain these conditions is to manipulate the learning situation so that the learner accepts the problem posed because of the rewards involved. Attention is maintained and appropriate stimulus-response connections are strengthened through the precise application of rewards toward the goals set by the teacher. A teacher's role is to cause appropriate S-R bonds to be built up in the learner's behavior repertoire. [Hilgard and Bower, 1966, pp. 22-23; Pittenger and Gooding, 1971, pp. 82-83]

Hilgard summarizes Guthrie's suggestions for teaching as follows:

1. If you wish to encourage a particular kind of behavior or discourage another, discover the cues leading to the behavior in question. In the one case, arrange the situation so that the desired behavior occurs when those cues are present; in the other case, arrange it so that the undesired behavior does not occur in the presence of the cues. This is all that is involved in the skillful use of reward and punishment. A student does not learn what was in a lecture or a book. He learns only what the lecture or book caused him to do.
2. Use as many stimulus supports for desired behavior as possible, because any ordinary behavior is a complex of movements to a complex of stimuli. The more stimuli there are associated with the desired behavior, the less likely that distracting stimuli and competing behavior will upset the desirable behavior. [Hilgard and Bower, 1966 pp. 86-87]

From B.F. Skinner's vantage point, "Teaching is simply the arrangement of contingencies of reinforcement." [Skinner, 1968, p. 5]. Subsequent statements in *The Technology of Teaching* throw further light on his position:

> Some promising advances have recently been made in the field of learning. Special techniques have been designed to arrange what are called contingencies of reinforcement—the relations which prevail between behavior on the one hand and the consequences of behavior on the other—with the result that a much more effective control of behavior has been achieved. [p.9]

> Comparable results have been obtained with pigeons, rats, dogs, monkeys, human children and psychotic subjects. In spite of great phylogenic differences, all these organisms show amazingly similar properties of the learning process. It should be emphasized that this has been achieved by analyzing the effects of reinforcement and by designing techniques which manipulate reinforcement with considerable precision. Only in this way can the behavior of the individual organism be brought under such precise control. [p. 14]

> A teaching machine is simply any device which arranges contingencies of reinforcement. There are as many different kinds of machines as there are different kinds of contingencies. Early experimenters

manipulated stimuli and reinforcers and recorded responses by hand, but current research without the help of extensive apparatus is unthinkable. The teacher needs similar instrumental support, for it is impossible to arrange many of the contingencies of reinforcement which expedite learning without it. Adequate apparatus has not eliminated the researcher, and teaching machines will not eliminate the teacher. [p. 65]

In college and graduate schools the aversive pattern survives in the now almost universal system of "assign and test". The teacher does not teach, he simply holds the student responsible for learning. The student must read books, study tests, perform experiments, and attend lectures, and he is responsible for doing so in the sense that, if he does not correctly report what he has seen, heard, or read, he will suffer aversive consequences . . . .A test which proves to be too easy is made harder before being given again, ostensibly because an easy test does not discriminate, but more probably because the teacher is afraid of weakening the threat under which his students are working. A teacher is judged by his employers and colleagues by the severity of the threat he imposes: he is a good teacher if he makes his students work hard, regardless of how he does so or of how much he teaches them by doing so. [pp. 99-100].

The human organism does, of course, learn without being taught. It is a good thing that this is so, and it would no doubt be a good thing if more could be learned in that way . . . But discovery is no solution to the problems of education. A culture is no stronger than its capacity to transmit itself. It must impart an accumulation of skills, knowledge, and social and ethical practices to its new members. The institution of education is designed to serve this purpose . . . It is dangerous to suggest to the student that it is beneath his dignity to learn what others already know, that there is something ignoble (and even destructive of "rational powers") in memorizing facts, codes, formulae, or passages from literary works, and that to be admired he must think in original ways. It is equally dangerous to forego teaching important facts and principles in order to give the student a chance to discover them for himself. [p. 110]

The implications of these concepts of the nature of teaching and the role of the teacher for the specific behavior of the teacher or trainer are described in some detail in Appendix A.

Hull was primarily concerned with the development of a systematic behavior theory that would improve the laboratory study of learning, and so he gave little attention to its implications for teaching. In assessing the significance of his work for education, Kingsley and Garry point out,

> Systematic order and arrangement would characterize the class room patterned after Hull's theory. The development of habits and skills would proceed from the simple to the complex with a clear understanding of the stimuli and responses to be associated. The program would have to be dynamic and stimulating in view of the central position that reinforcement holds, inasmuch as aroused drives which can be reduced by satisfying outcomes are an essential condition of learning. . .Practice would be presented for the purpose of building the desired habits and maintaining them, but would not proceed to the point at which the increase in inhibition from repeating the same response would make the child reluctant to respond. [Kingsley and Garry, 1957, pp. 104-105].

Tolman was also principally concerned with the laboratory study of learning, and Kingsley and Garry point out that "the fact that Tolman accepts different forms of learning makes it more difficult to infer how an educational program which followed his theory literally would operate." But the teacher's task would be concerned primarily with "the creating of stimulus-conditions which make it possible for the learner to perceive clearly what leads to what, and to understand the different means by which a given goal can be reached. Emphasis would be placed upon making vivid the relationships between the parts and the whole . . . Because of variations in capacity with age, previous experience, etc., it would be necessary to select learning tasks which can be perceived as wholes." [Kingsley and Garry, 1957, pp. 119-120]

The Gestalt psychologists saw the teacher's task as being essentially to help the individual see significant relationships and to manage instruction so that he organizes his experiences into functional patterns. Through verbal explanations, showing pictures, putting words on chalkboards, presenting reading matter, and many other teaching activities, the teacher provides stimulating situations.

> For this reason, careful lesson planning with due regard for suitable arrangement and orderly presentation is essential for good teaching. Practices conducive to the establishment of appropriate relations and organization include starting with the familiar, basing each step on those already taken, putting together facts which belong together, grouping items according to their natural connections, placing subtopics under the topic to which they belong, using illustrations based on the learner's experience, giving major emphasis to essentials, centering supporting details around the main points, and avoiding irrelevant details. [Kingsley and Garry, 1957, pp. 111-112].

Furthermore, all the divisions and topics of each subject must be integrated, and all the various subjects of a course or program must be related to one another.

Robert Gagne, in *The Conditions of Learning* (1965) agrees with these learning theorists that teaching means the arranging of conditions that are external to the learner [p. 26], but he disagrees that learning is a phenomenon which can be explained by simple theories. He believes that there are eight distinct types of learning, each with its own set of required conditions, as follows:

Type 1: *Signal Learning*. The individual learns to make a general, diffuse response to a signal. This is the classical conditioned response of Pavlov.

Type 2: *Stimulus-Response Learning*. The learner acquires a precise response to a discriminated stimulus. What is learned is a connection (Thorndike) or a discriminated operant (Skinner), sometimes called an instrumental response (Kimble).

Type 3: *Chaining*. What is acquired is a chain of two or more stimulus-response connections. The conditions for such learning have been described by Skinner and others.

Type 4: *Verbal Association*. Verbal association is the learning of chains that are verbal. Basically, the conditions resemble those for other (motor) chains. However, the presence of language in the human being makes this a special type because internal links may be selected from the individual's previously learned repertoire of language.

Type 5: *Multiple Discrimination*. The individual learns to make *n* different identifying responses to as many different stimuli,

which may resemble each other in physical appearance to a greater or lesser degree.

Type 6: *Concept Learning.* The learner acquires a capability of making a common response to a class of stimuli that may differ from each other widely in physical appearance. He is able to make a response that identifies an entire class of objects or events.

Type 7: *Principle Learning.* In simplest terms, a principle is a chain of two or more concepts. It functions to control behavior in the manner suggested by a verbalized rule of the form "If A, then B," where A and B are concepts. However, it must be carefully distinguished from the mere verbal sequence "If A, then B," which, of course, may also be learned as type 4.

Type 8: *Problem Solving.* Problem solving is a kind of learning that requires the internal events usually called thinking. Two or more previously acquired principles are somehow combined to produce a new capability that can be shown to depend on a "higher-order" principle. [pp. 58-59].

Gagne further believed that the most important class of conditions that distinguishes one form of learning from another is its prerequisites, since the types are in hierarchical order, as follows:

> Problem solving (type 8) requires as prerequisites:
> Principles (type 7), which require as prerequisites:
> Concepts (type 6), which require as prerequisites:
> Multiple discriminations (type 5), which require as prerequisites:
> Verbal associations (type 4) or other chains (type 3), which require as prerequisites:
> Stimulus-response connections (type 2). [p. 60]

Gagne specifies eight component functions of the instructional situation, representing the ways in which the learner's environment acts on him, that must be managed by the teacher:

1. *Presenting the stimulus.* Every type of learning requires a stimulus, and usually these stimuli must be located within the learning environment, outside the learner. If a chain is being learned, an external cue must be provided for each link, even though these

cues may become unnecessary later. If multiple discrimination is to be accomplished, the stimuli to be discriminated must be displayed so that correct connections can become differentiated from incorrect ones. If concepts are being learned, a suitable variety of objects or events representing a class must be displayed. If principles are being acquired, the stimulus objects to which they are expected to apply must somehow be represented to the student. And if problem solving is undertaken, the "problem situation" must similarly be represented and displayed. Obviously, these various stimuli can be presented in many different ways by objects already in the learner's environment, or by means of pictures, printed books, or oral communication.

2. *Directing attention and other learner activities.* Environmental components also act on the learner by directing his attention to certain stimuli or aspects of stimulus objects and events. In very young children, vivid or suddenly changing stimulation may be used for this purpose. Very soon these can be supplanted by oral commands, and later still by printed directions such as, "Notice the number of electrons in the outer ring," or "Look at the graph in Figure 23." Activities other than attention may also be directed by such instructions, as implied by the statements, "Remember how a line is defined," or "Complete the following sentence." These activities are not themselves learning; they are simply actions that must be taken by the learner in order to create the proper conditions for learning. Verbal directions that have these purposes can be presented either orally or in printed form.
3. *Providing a model for terminal performance.* The importance of the function of informing the learner about the general nature of the performance to be acquired has been emphasized previously on several occasions. There is no single way of doing this, and many different components of the instructional situation may be employed. Most commonly, the "model" of performance to be expected following learning is conveyed by oral or printed communication.
4. *Furnishing external prompts.* In learning chains as well as multiple discriminations, cues may be provided in the instructional situation to establish a proper sequence of connections or to increase the distinctiveness of stimuli. As learning proceeds, these extra cues may be made to "vanish" when they are no

longer needed. Stimuli that function as extra cues may take a variety of forms. For example, they may be pictorial, as when a sequence is depicted in a diagram reading from left to right. Or they may be auditory, as in emphasizing the differences in sound of such French words as *rue* and *rouge*. Verbal stimuli are often employed for both these purposes, as well as for the purpose of furnishing distinctive "coding links" in verbal chains. In Gilbert's (1962) example of learning color coding for resistors, the word "penny" is provided as a link between *brown* and *one*, the word "nothingness" as a link between *black* and *zero*.

5. *Guiding the direction of thinking*. When principles are being learned, and particularly when learning takes the form of problem solving, the direction of recalled internal connections (thoughts) may be guided by instructions from the learner's environment. As described previously, such guidance is presumed to have the effect of increasing the efficiency of learning by reducing the occurrence of irrelevant "hypotheses." Generally, instructions having this function of "hinting" and "suggesting" take the form of oral or printed prose statements.
6. *Inducing transfer of knowledge*. Providing for the transfer of learned concepts and principles to novel situations may be accomplished in a number of ways. The conduct of discussion is one of the most convenient. Obviously, this is a special kind of interaction between the learner and his environment, and it is not possible to specify exactly what form will be taken at any given moment by stimulation from the environment. The process is usually initiated, however, by verbally stated questions of the "problem-solving" variety. An important alternative method is to place the individual within a problem situation more or less directly, without the use of words to describe it. A science demonstration may be used to serve this function. Also, motion pictures can be used with considerable effectiveness to initiate problem-solving discussion by "getting the students into the situation" in a highly realistic manner.
7. *Assessing learning attainments*. The environment of the learner also acts on him to assess the extent to which he has attained a specific learning objective or subobjective. It does this by deliberately placing him in representative problem situations that concretely reflect the capability he is expected to have learned. Most frequently, this is done by asking him questions. Although

it is conceivable for the learner to formulate for himself the questions to be asked, this is difficult to do even for the experienced adult learner. Preferably, the questions must come from an independent source, so that they will be uninfluenced by the learner's wishes, but will accurately represent the objective.

8. *Providing feedback*. Closely related to assessment of learning outcomes is the provision for feedback concerning the correctness of the learner's responses. The questions that are asked the learner, followed by his answers, must in turn be followed by information that tells him whether he is right or wrong. Sometimes, the provision for this feedback function of the learner's environment is very simple to arrange: a foreign word pronounced by the student may sound like one he hears on a tape; the color of a chemical solution may indicate the presence of an element he is searching for. At other times it may be considerably more complex, as when the adequacy of a constructed prose paragraph describing an observed event is assessed, and the results fed back to the student.

These eight functions, then, represent the ways in which the learner's environment acts on him. These are the external conditions of learning that, when combined with certain prerequisite capabilities within the learner, bring about the desired change in his performance. Obviously, there are many ways to establish these conditions in the learning environment, and many combinations of objects, devices, and verbal communications may be employed in doing so. Probably the most important consideration for the design of the learning environment, however, is not that several alternative ways of accomplishing the same function are usually available. Rather, the important point is that for a given function, certain means of interacting with the learner are quite ineffective. Accordingly, the characteristics of various *media of instruction* in performing these functions need to be considered carefully in making a choice. [Gagne, 1965, pp. 268-271].

These are the learning theorists who Hilgard believed would agree with his twenty principles (with the exception of the motivation and personality theorists, whom Hilgard didn't identify, so we can't check with them directly). Obviously these theorists are unanimous in seeing teaching as the management of procedures which

will assure specified behavioral changes as prescribed learning products. The role of the teacher, therefore, is that of a shaper of behavior. Stated this baldly, it smacks of what contemporary critics of education see as a God-playing role. [Bereiter, 1972, p. 25; Illich, 1970, p. 30]

Concepts of Teaching Derived from Theories of Learning of Adults

These were theories based primarily on studies of animals and children. When we look at the concepts of teaching of those theorists who derived their theories of learning primarily from studies of adults they are very different. Carl Rogers makes one of the sharpest breaks in his lead statement:

> Teaching, in my estimation, is a vastly over-rated function. Having made such a statement, I scurry to the dictionary to see if I really mean what I say. Teaching means 'to instruct.' Personally I am not much interested in instructing another in what he should know or think. 'To impart knowledge or skill.' My reaction is, why not be more efficient, using a book or programmed learning? 'To make to know.' Here my hackles rise. I have no wish to *make* anyone know something. 'To show, guide, direct.' As I see it, too many people have been shown, guided, directed. So I come to the conclusion that I *do* mean what I said. Teaching is, for me, a relatively unimportant and vastly overvalued activity. [Rogers, 1969, p. 103].

Rogers goes on to explain that in his view teaching and the imparting of knowledge make sense in an unchanging environment, which is why it has been an unquestioned function for centuries. "But if there is one truth about modern man, it is that he lives in an environment which is *continually changing*," and therefore the aim of education must be the *facilitation of learning*. [*Ibid*., pp. 104-105]. He defines the role of the teacher as that of a *facilitator of learning*. The critical element in performing this role is the personal relationship between the facilitator and the learner, which in turn is dependent on the facilitator's possessing three attitudinal qualities: (1) realness or genuineness, (2) non-possessive caring, prizing, trust,

and respect, and (3) empathic understanding and sensitive and accurate listening. [*Ibid.*, pp. 106-126].

He provides the following guidelines for the facilitation of learning:

1. The facilitator has much to do with setting the initial mood or climate of the group or class experience.
2. The facilitator helps to elicit and clarify the purposes of the individuals in the class as well as the more general purposes of the group.
3. He relies upon the desire of each student to implement those purposes which have meaning for him, as the motivational force behind significant learning.
4. He endeavors to organize and make easily available the widest possible range of resources for learning.
5. He regards himself as a flexible resource to be utilized by the group.
6. In responding to expressions in the classroom group, he accepts both the intellectual content and the emotionalized attitudes, endeavoring to give each aspect the approximate degree of emphasis which it has for the individual or the group.
7. As the acceptant classroom climate becomes established, the facilitator is able increasingly to become a participant learner, a member of the group, expressing his views as those of one individual only.
8. He takes the initiative in sharing himself with the group—his feelings as well as his thoughts—in ways which do not demand or impose but represent simply a personal sharing which students may take or leave.
9. Throughout the classroom experience, he remains alert to the expressions indicative of deep or strong feelings.
10. In his functioning as a facilitator of learning, the leader endeavors to recognize and accept his own limitations. [*Ibid.*, pp. 164-166].

Although Maslow does not spell out his conception of the role of teacher, he no doubt would subscribe to Rogers' guidelines, with perhaps a bit more emphasis on the teacher's responsibility for providing safety. Several followers of both Rogers and Maslow have experimented with translating their theories into classroom behavior. George Brown, for example, describes the development of

confluent education ("the term for the integration or flowing together of the affective and cognitive elements in individual and group learning") in the Ford-Esalen Project in Affective Education in California in the late 1960's in his *Human Teaching for Human Learning*, 1971. Elizabeth Drews describes an experiment to test a new program designed to foster self-initiated learning and self-actualization in ninth graders in Michigan, in which the teachers defined their roles as facilitators of learning. [Drews, 1966].

Flowing in the same stream of thought, Goodwin Watson provides the following summary of "what is known about learning"—which is easily read as "guidelines for the facilitation of learning":

1. Behavior which is rewarded—from the learner's point of view—is more likely to recur.
2. Sheer repetition without reward is a poor way to learn.
3. Threat and punishment have variable effects upon learning, but they can and do commonly produce avoidance behavior—in which the reward is the diminution of punishment possibilities.
4. How "ready" we are to learn something new is contingent upon the confluence of diverse—and changing—factors, some of which include:
   a. adequate existing experience to permit the new to be learned (we can learn only in relation to what we already know);
   b. adequate significance and relevance for the learner to engage in learning activity (we learn only what is appropriate to our purposes);
   c. freedom from discouragement, the expectation of failure, or threats to physical, emotional, or intellectual well-being.
5. *Whatever* is to be learned will remain unlearnable if we believe that we cannot learn it or if we perceive it as irrelevant or if the learning situation is perceived as threatening.
6. Novelty (per 4 and 5 above) is generally rewarding.
7. We learn best that which we participate in selecting and planning ourselves.
8. Genuine participation (as compared with feigned participation intended to avoid punishment) intensifies motivation, flexibility, and rate of learning.
9. An autocratic atmosphere (produced by a dominating teacher who controls direction via intricate punishments) produces in learners

apathetic conformity, various—and frequently devious—kinds of defiance, scapegoating (venting hostility generated by the repressive atmosphere on colleagues), or escape . . . An autocratic atmosphere also produces increasing dependence upon the autnority, with consequent obsequiousness, anxiety, shyness, and acquiescence.

10. "Closed," authoritarian environments (such as are characteristic of most conventional schools and classrooms) condemn most learners to continuing criticism, sarcasm, discouragement, and failure so that self-confidence, aspiration (for anything but escape), and a healthy self-concept are destroyed.
11. The best time to learn anything is when whatever is to be learned is immediately useful to us.
12. An "open," nonauthoritarian atmosphere can, then, be seen as conducive to learner initiative and creativity, encouraging the learning of attitudes of self-confidence, originality, self-reliance, enterprise, and independence. All of which is equivalent to learning how to learn. [Watson, 1960-1961].

Houle has proposed a "fundamental system" of educational design which rests on seven assumptions:

1. Any episode of learning occurs in a specific situation and is profoundly influenced by that fact.
2. The analysis or planning of educational activities must be based on the realities of human experience and upon their constant change.
3. Education is a practical art (like architecture) which draws on many theoretical disciplines in the humanities; and the social and biological sciences.
4. Education is a cooperative rather than an operative art. ("An operative art is one in which the creation of a product or performance is essentially controlled by the person using the art . . . A cooperative art . . . works in a facilitative way by guiding and directing a natural entity or process. The farmer, physician, and educator are three classic examples of cooperative artists.")
5. The planning or analysis of an educational activity is usually undertaken in terms of some period which the mind abstracts for analytical purposes from the complicated reality.
6. The planning or analysis of an educational activity may be undertaken by an educator, a learner, an independent analyst, or some combination of the three.

7. Any design of education can best be understood as a complex of interacting elements, not as a sequence of events. [Houle, 1972, pp. 32-39].

He then identifies the following components in his fundamental system, which it is the task of the educator to manage:

1. A possible educational activity is identified.
2. A decision is made to proceed.
3. Objectives are identified and refined.
4. A suitable format is designed.
   a. Learning resources are selected.
   b. A leader or group of leaders is chosen.
   c. Methods are selected and used.
   d. A time schedule is made.
   e. A sequence of events is devised.
   f. Social reinforcement of learning is provided.
   g. The nature of each individual learner is taken into account.
   h. Roles and relationships are made clear.
   i. Criteria for evaluating progress are identified.
   j. The design is made clear to all concerned.
5. The format is fitted into larger patterns of life.
   a. Learners are guided into or out of the activity both at the beginning and subsequently.
   b. Life styles are modified to allow time and resources for the new activity.
   c. Financing is arranged.
   d. The activity is interpreted to related publics.
6. The program is carried out.
7. The results of the activity are measured and appraised.
8. The situation is examined in terms of the possibility of a new educational activity. [*Ibid.*, pp. 48-56]

Because Tough's studies have been concerned with the self-initiated learning projects of adults, he has focused on the "helping role" of the teacher or other resource person. His investigations have produced the following "fairly consistent composite picture of the ideal helper":

One cluster of characteristics might be summarized by saying that the ideal helper is warm and loving. He accepts and cares about the learner and about his project or problem, and takes it seriously. He is willing to spend time helping. He is approving, supportive, encouraging, and friendly. He regards the learner as an equal. As a result of these characteristics, the learner feels free to approach this ideal helper, and can talk freely and easily with him in a warm and relaxed atmosphere.

A second cluster of characteristics involves the helper's perceptions of the person's capacity as a self-planner. The ideal helper has confidence in the learner's ability to make appropriate plans and arrangements for his learning. The helper has a high regard for his skill as a self-planner, and does not want to take the decision-making control away from him.

Third, the ideal helper views his interaction with the learner as a dialogue, a true encounter in which he listens as well as talks. His help will be tailored to the needs, goals, and requests of this unique learner. The helper listens, accepts, understands, responds, helps. These perceptions of the interaction are in sharp contrast to those of "helpers" who want to control, command, manipulate, persuade, influence, and change the learner. Such helpers seem to view communication as "an inexhaustible monologue, addressed to everyone and no one in the form of 'mass communication' . . . Such a helper perceives the learner as an object, and expects to do something *to* that object. He is not primarily interested in the other person as a person, and in his needs, wishes, and welfare."

Another cluster of internal characteristics involves the helper's reasons for helping. He may help because of his affection and concern for the learner. Or the helper may, in an open and positive way, expect to gain as much as he gives. Other sorts of motivation, too, are possible—pleasure from knowing he was helpful, satisfaction from seeing progress or from the learner's gratitude . . .

Finally, the ideal helper is probably an open and growing person, not a closed, negative, static, defensive, fearful, or suspicious sort of person. He himself is frequently a learner, and seeks growth and new experiences. He probably tends to be spontaneous and authentic, and to

> feel free to behave as a unique person rather than in some stereotyped way. [Tough, 1971, pp. 181-183]

These characteristics fit well into my own conception of the role of the andragogical teacher, which I have attempted to make operational as a set of principles as shown in Table 4-1.

Concepts of Teaching Derived from Theories of Teaching

Some teaching theories have evolved directly from learning theories, especially the mechanistic models. Other theories of teaching evolved from analyses of teacher behavior and its consequences and from experimenting with manipulation of the variables in the teaching-learning situation. Since the previous section has presented teaching theories derived from learning theories, let us turn now to concepts derived from theories of teaching.

Dewey's Concepts

Perhaps the most impactful system of ideas about effective teaching was propounded by John Dewey during the first half of this century. Dewey contrasted his basic principles with those of traditional education:

> To imposition from above is opposed expression and cultivation of individuality; to external discipline is opposed free activity; to learning from texts and teacher, learning through experience; to acquisition of isolated skills and techniques by drill, is opposed acquisition of them as means of attaining ends which make direct vital appeal; to preparation for a more or less remote future is opposed making the most of the opportunities of present life; to static aims and materials is opposed acquaintance with a changing world. [Dewey, 1938, pp. 5-6].

Dewey's system is organized around several key concepts. The central concept is *experience:*

All genuine education comes about through experience. [*Ibid.*, p. 13]

The central problem of an education based upon experience is to select the kind of present experiences that live fruitfully and creatively in subsequent experiences. [*Ibid.*, pp. 16-17]

A second key concept is *democracy*:

The question I would raise concerns why we prefer democratic and humane arrangements to those which are autocratic and harsh. . . . Can we find any reason that does not ultimately come down to the belief that democratic social arrangements promote a better quality of human experience, one which is more widely accessible and enjoyed, than do non-democratic and anti-democratic forms of social life? [*Ibid.*, pp. 24-25]

Another key concept is *continuity*:

The principle of continuity of experience means that every experience both takes up something from those which have gone before and modifies in some way the quality of those which come after. . . Growth, or growing and developing, not only physically but intellectually and morally, is one exemplification of the principle of continuity. [*Ibid.*, pp. 27-28]

It is worth while to say something about the way in which the adult [teacher] can exercise the wisdom his own wider experience gives him without imposing a merely external control. On one side, it is his business to be on the alert to see what attitudes and habitual tendencies are being created. In this direction he must, if he is an educator, be able to judge what attitudes are actually conducive to continued growth and what are detrimental. He must, in addition, have that sympathetic understanding of individuals as individuals which gives him an idea of what is actually going on in the minds of those who are learning. [*Ibid.*, p. 33]

A primary responsibility of educators is that they not only be aware of the general principle of the shaping of actual experience by environing conditions, but that they also recognize in the concrete what surroundings are conducive to having experiences that lead to growth. Above all, they should know how to utilize the surroundings, physical and

Table 4-1.
The Role of the Teacher

Conditions of Learning	Principles of Teaching
The learners feel a need to learn.	1. The teacher exposes students to new possibilities for self-fulfillment. 2. The teacher helps each student clarify his own aspirations for improved behavior. 3. The teacher helps each student diagnose the gap between his aspiration and his present level of performance. 4. The teacher helps the students identify the life problems they experience because of the gaps in their personal equipment.
The learning environment is characterized by physical comfort, mutual trust and respect, mutual helpfulness, freedom of expression, and acceptance of differences:	5. The teacher provides physical conditions that are comfortable (as to seating, smoking, temperature, ventilation, lighting, decoration) and conducive to interaction (preferably, no person sitting behind another person). 6. The teacher accepts each student as a person of worth and respects his feelings and ideas. 7. The teacher seeks to build relationships of mutual trust and helpfulness among the students by encouraging cooperative activities and refraining from inducing competitiveness and judgmentalness.

Table 4-1 continued

Conditions of Learning	Principles of Teaching
	8. The teacher exposes his own feelings and contributes his resources as a colearner in the spirit of mutual inquiry.
The learners perceive the goals of a learning experience to be their goals.	9. The teacher involves the students in a mutual process of formulating learning objectives in which the needs of the students, of the institution, of the teacher, of the subject matter, and of the society are taken into account.
The learners accept a share of the responsibility for planning and operating a learning experience, and therefore have a feeling of commitment toward it.	10. The teacher shares his thinking about options available in the designing of learning experiences and the selection of materials and methods and involves the students in deciding among these options jointly.
The learners participate actively in the learning process.	11. The teacher helps the students to organize themselves (project groups, learning-teaching teams, independent study, etc.) to share responsibility in the process of mutual inquiry.
The learning process is related to and makes use of the experience of the learners.	12. The teacher helps the students exploit their own experiences as resources for learning through the use of such techniques as discussion, role playing, case method, etc.
	13. The teacher gears the presentation of his own resources to

Table 4-1 continued

Conditions of Learning	Principles of Teaching
The learners have a sense of progress toward their goals.	the levels of experience of his particular students. 14. The teacher helps the students to apply new learning to their experience, and thus to make the learnings more meaningful and integrated. 15. The teacher involves the students in developing mutually acceptable criteria and methods for measuring progress toward the learning objectives. 16. The teacher helps the students develop and apply procedures for self-evaluation according to these criteria.
	[Knowles, 1970, p. 52-53]

social, that exist so as to extract from them all that they have to contribute to building up experiences that are worth while. [*Ibid.*, p. 35]

Another key concept is *interaction*:

The word "interaction" expresses the second chief principle for interpreting an experience in its educational function and force. It assigns equal rights to both factors in experience—objective and internal conditions. Any normal experience is an interplay of these two sets of conditions. Taken together, or in their interaction, they form what we call a *situation*. The trouble with traditional education was not that it emphasized the external conditions that enter into the control of the experiences but that it paid so little attention to the internal factors which

also decide what kind of experience is had [the powers and purposes of those taught]. [*Ibid.*, pp. 38-44]

It is not the subject *per se* that is educative or that is conducive to growth. There is no subject that is in and of itself, or without regard to the stage of growth attained by the learner, [an end] such that inherent educational value may be attributed to it. Failure to take into account adaptation to the needs and capacities of individuals was the source of the idea that certain subjects and certain methods are intrinsically cultural or intrinsically good for mental discipline. . .In a certain sense every experience should do something to prepare a person for later experiences of a deeper and more expansive quality. That is the very meaning of growth, continuity, reconstruction of experience. [*Ibid.*, pp. 46-47]

The educator is responsible for a knowledge of individuals and for a knowledge of subject-matter that will enable activities to be selected which lend themselves to social organization, an organization in which all individuals have an opportunity to contribute something, and in which the activities in which all participate are the chief carrier of control. . .The principle that development of experience comes about through interaction means that education is essentially a social process. . .The teacher loses the position of external boss or dictator but takes on that of leader of group activities. [*Ibid.*, pp. 61-66]

It is possible of course to abuse the office, and to force the activity of the young into channels which express the teacher's purpose rather than that of the pupils. But the way to avoid this danger is not for the adult to withdraw entirely. The way is, first, for the teacher to be intelligently aware of the capacities, needs, and past experiences of those under instruction, and, secondly, to allow the suggestion made to develop into a plan and project by means of the further suggestions contributed and organized into a whole by the members of the group. The plan, in other words, is a cooperative enterprise, not a dictation. [*Ibid.*, p. 85]

Many of Dewey's ideas were distorted, misinterpreted, and exaggerated during the heyday of the progressive school movement a generation ago, which is why I thought it important to quote him directly. In light of contemporary thinking about teaching, though, don't they seem fresh and useful?

Teaching through Inquiry

A second set of concepts about teaching with roots both in Dewey's ideas—especially his formulation of scientific thinking—and in those of the cognitive theorists is variously referred to as the discovery method, the inquiry method, self-directed learning or problem-solving learning.

Jerome Bruner, perhaps the most notable proponent of this approach to teaching, is in the process of constructing a theory of instruction that will meet these four criteria:

1. A theory of instruction should specify the experiences which most effectively implant in the individual a predisposition toward learning.
2. A theory of instruction must specify the ways in which a body of knowledge should be structured so that it can be most readily grasped by the learner.
3. A theory of instruction should specify the most effective sequences in which to present the materials to be learned.
4. A theory of instruction should specify the nature and pacing of rewards and punishments in the process of learning and teaching. [Bruner, 1966, pp. 40-41]

His system is predicated on the existence in all people of the will to learn.

> The will to learn is an intrinsic motive, one that finds both its source and its reward in its own exercise. The will to learn becomes a "problem" only under specialized circumstances like those of a school, where a curriculum is set, students confined, and a path fixed. The problem exists not so much in learning itself, but in the fact that what the school imposes often fails to enlist the natural energies that sustain spontaneous learning—curiosity, a desire for competence, aspiration to emulate a model, and a deep-sensed commitment to the web of social reciprocity [the human need to respond to others and to operate jointly with them toward an objective]. [*Ibid.*, pp. 125-127]

Bruner further makes a distinction between teaching in the *expository mode* and teaching in the *hypothetical mode*.

> In the former, the decisions concerning the mode and pace and style of exposition are principally determined by the teacher as expositor; the student is the listener. . .In the hypothetical mode, the teacher and the student are in a more cooperative position. . .The student is not a bench-bound listener, but is taking a part in the formulation and at times may play the principal role in it. [Bruner, 1961, p. 126]

The hypothetical mode leads to students' engaging in *acts of discovery*, a process which Bruner sees as having four benefits: (1) increasing intellectual powers, (2) shifting from extrinsic to intrinsic rewards, (3) learning the heuristics of discovering and (4) making material more readily accessible in memory. This mode is more congruent with and more likely to nurture the will to learn.

Bruner conveys the operational aspects of discovery teaching by describing it in action in case studies of actual courses. But Postman and Weingartner provide the following list of behaviors observable in teachers using the inquiry method:

> *The teacher rarely tells students what he thinks they ought to know.* He believes that telling, when used as a basic teaching strategy, deprives students of the excitement of doing their own finding and of the opportunity for increasing their power as learners.
>
> *His basic mode of discourse with students is questioning.* While he uses both convergent and divergent questions, he regards the latter as the more important tool. He emphatically does not view questions as a means of seducing students into parroting the text or syllabus; rather, he sees questions as instruments to open engaged minds to unsuspected possibilities.
>
> *Generally, he does not accept a single statement as an answer to a question.* In fact, he has a persisting aversion to anyone, any syllabus, any text that offers The Right Answer. Not because answers and solutions are unwelcome—indeed, he is trying to help students be more efficient problem solvers—but because he knows how often The Right Answer serves only to terminate further thought. He knows the power of pluralizing. He does not ask for the reason, but for the reasons. Not for the cause, but the causes. Never the meaning, the meanings. He knows,

too, the power of contingent thinking. He is the most "It depends" learner in his class.

He encourages student-student interaction as opposed to student-teacher interaction. And generally he avoids acting as a mediator or judge of the quality of ideas expressed. If each person could have with him at all times a full roster of authorities, perhaps it would not be necessary for individuals to make independent judgments. But so long as this is not possible, the individual must learn to depend on himself as a thinker. The inquiry teacher is interested in students' developing their own criteria or standards for judging the quality, precision, and relevance of ideas. He permits such development to occur by minimizing his role as arbiter of what is acceptable and what is not.

He rarely summarizes the positions taken by students on the learnings that occur. He recognizes that the act of summary or "closure" tends to have the effect of ending further thought. Because he regards learning as a process, not a terminal event, his "summaries" are apt to be stated as hypotheses, tendencies, and directions. He assumes that no one ever learns once and for all how to write, or how to read, or what were the causes of the Civil War. Rather, he assumes that one is always in the process of acquiring skills, assimilating new information, formulating or refining generalizations. Thus, he is always cautious about defining the limits of learning, about saying, "This is what you have learned during the past 45 minutes," or "This is what you will learn between now and the Christmas holidays," or even (especially), "This is what you will learn in the ninth grade." The only significant terminal behavior he recognizes is death, and he suspects that those who talk of learning as some kind of "terminal point" are either compulsive travelers or have simply not observed children closely enough. Moreover, he recognizes that learning does not occur with the same intensity in any two people, and he regards verbal attempts to disregard this fact as a semantic fiction. If a student has arrived at a particular conclusion, then little is gained by the teacher's restating it. If the student has not arrived at a conclusion, then it is presumptuous and dishonest for the teacher to contend that he has. (Any teacher who tells you precisely what his students learned during any lesson, unit, or semester quite literally does not know what he is talking about.)

His lessons develop from the responses of students and not from a previously determined "logical" structure. The only kind of lesson plan,

or syllabus, that makes sense to him is one that tries to predict, account for, and deal with the authentic responses of learners to a particular problem: the kinds of questions they will ask, the obstacles they will face, their attitudes, the possible solutions they will offer, etc. Thus, he is rarely frustrated or inconvenienced by "wrong answers," false starts, irrelevant directions. These are the stuff of which his best lessons and opportunities are made. In short, the "content" of his lessons are the responses of his students. Since he is concerned with the processes of thought rather than the end results of thought (The Answer!), he does not feel compelled to "cover ground" (there's the traveler again), or to insure that his students embrace a particular doctrine, or to exclude a student's idea because it is not germane. (Not germane to what? Obviously, it is germane to the student's thinking about the problem.) He is engaged in exploring the *way* students think, not what they should think (before the Christmas holidays). That is why he spends more of his time listening to students than talking to or at them.

Generally, each of his lessons poses a problem for students. Almost all of his questions, proposed activities, and assignments are aimed at having his students clarify a problem, make observations relevant to the solution of the problem, and make generalizations based on their observations. His goal is to engage students in those activities which produce knowledge: defining, questioning, observing, classifying, generalizing, verifying, applying. As we have said, *all knowledge is a result of these activities*. Whatever we think we "know" about astronomy, sociology, chemistry, biology, linguistics, etc., was discovered or invented by someone who was more or less an expert in using inductive methods of inquiry. Thus, our inquiry, or "inductive," teacher is largely interested in helping his students to become more proficient as users of these methods.

He measures his success in terms of behavioral changes in students: the frequency with which they ask questions; the increase in the relevance and cogency of their questions; the frequency and conviction of their challenges to assertions made by other students or teachers or textbooks; the relevance and clarity of the standards on which they base their challenges; their willingness to suspend judgments when they have insufficient data; their willingness to modify or otherwise change their position when data warrant such change; the increase in their skill in observing, classifying, generalizing, etc.; the increase in their tolerance for diverse answers; their ability to apply generalizations, attitudes, and information to novel situations.

> These behaviors and attitudes amount to a definition of a different *role* for the teacher from that which he has traditionally assumed. The inquiry environment, like any other school environment, is a series of human encounters, the nature of which is largely determined by the "teacher." "Teacher" is here placed in quotation marks to call attention to the fact that most of its conventional meanings are inimical to inquiry methods. It is not uncommon, for example, to hear "teachers" make statements such as, "Oh, I taught them that, but they didn't learn it." There is no utterance made in the Teachers' Room more extraordinary than this. From our point of view, it is on the same level as a salesman's remarking, "I sold it to him, but he didn't buy it"—which is to say, it makes no sense. It seems to mean that "teaching" is what a "teacher" does, which, in turn, may or may not bear any relationship to what those being "taught" do. [Postman and Weingartner, 1969, pp. 34-37]

Suchman has described vividly the success of the Inquiry Training Project at the University of Illinois in developing inquiry skills in elementary school children. As a result of this experience, he feels confident in the feasibility of "an inquiry-centered curriculum."

> . . . in which the children would find themselves launched into areas of study by first being confronted by concrete problem-focused episodes for which they would attempt to build explanatory systems. Part of their data gathering might well be in the question-asking mode and certainly along the way time would have to be spent in building inquiry skills through critiques and other such procedures. Yet there would also be room for helping the children enlarge their conceptual systems through more teacher-directed means. [Suchman, 1972, p. 158]

Crutchfield counts four sets of skills involved in *productive thinking*, his synonym for problem-solving or inquiry learning.

> (1) skills of problem discovery and formulation
> (2) skill in organizing and processing problem information
> (3) skill in idea generation, and
> (4) skill in the evaluation of ideas. [Crutchfield, 1972, pp. 192-195]

The notion that the development of skills of inquiry should be a primary goal of youth education is the cornerstone of the concept of education as a lifelong process. This makes it especially significant that the Governing Board of the UNESCO Institute for Education in Hamburg, Germany decided in March 1972 to focus on research and experimental projects in an exploratory study, "The Concept of Lifelong Education and Its Implications for School Curriculum." A working paper I prepared for this study is reproduced in Appendix D.

Teaching through Modeling

The most elaborate system of thought on *imitation, identification* or *modeling* as concepts of teaching has been developed by Albert Bandura at Stanford University. He labels the system *social learning*. Bandura regards reinforcement theories of instrumental conditioning, such as Skinner's, as able to account for the control of previously learned matching responses, but unable to account for the way new response patterns are acquired through observation and imitation.

In teaching by modeling, the teacher behaves in ways that he wants the learner to imitate; The teacher's basic technique is *role modeling*. Bandura and Walters (1963) identified three kinds of effects from exposing the learner to a model: (1) a modeling effect, whereby the learner acquires new kinds of response patterns; (2) an inhibitory or disinhibitory effect, whereby the learner decreases or increases the frequency, latency or intensity of previously acquired responses; and (3) an eliciting effect, whereby the learner merely receives from the model a cue for releasing a response that is neither new nor inhibited. For example, the modeling effect occurs when the teacher shows learners how to listen empathically to one another by himself listening empathically to them. The inhibiting or disinhibiting effect occurs when the teacher lets the learners know, through modeling, that it is or is not approved behavior to express their feelings openly, and thus inhibits or disinhibits an old response. The eliciting effect occurs when, through modeling, the teacher teaches the art of giving and receiving feedback by inviting

the learners to criticize his own performance helpfully, thus providing a cue eliciting a response neither new nor inhibited.

Gage remarks that "Learning through imitation seems to be especially appropriate for tasks that have little cognitive structure." [Gage, 1972, p. 47]. This observation seems to be borne out by the fact that social learning has been applied principally to behavioral modification in therapeutic settings to correct deviant or antisocial behavior, but its application to such positive educational purposes as the development of attitudes, beliefs, and performance skills has also been demonstrated. [Bandura, 1969, pp. 599-624] No doubt every teacher employs modeling as one of his techniques, whether consciously or unconsciously. His potency as a model will be influenced by such characteristics as age, sex, socio-economic status, social power, ethnic background, and intellectual and vocational status. [*Ibid.*, p. 195]

Although social learning has been employed chiefly to achieve behavioral changes through external management of reinforcement contingencies, in recent years there has been a growing interest in self-control processes in which individuals regulate their own behavior by arranging appropriate contingencies for themselves. These self-directed endeavors comprise a variety of strategies, about which Bandura makes these observations.

> The *selection of well-defined objectives*, both intermediate and ultimate, is an essential aspect of any self-directed program of change. The goals that individuals choose for themselves must be specified in sufficiently detailed behavioral terms to provide adequate guidance for the actions that must be taken daily to attain desired outcomes.
>
> To further increase goal commitment participants are asked to make *contractual agreements* to practice self-controlling behaviors in their daily activities. Thus, for example, in modifying smoking behavior [Tooley & Pratt, 1967] and obesity [Ferster, Nurnberger, & Levitt, 1962], clients agree to restrict increasingly, in graduated steps, the times and places in which they will engage in the undesired behavior. Under conditions where individuals voluntarily commit themselves to given courses of action, subsequent tendencies to deviate are likely to be counteracted by negative self-evaluations. Through this mechanism,

and anticipated social reactions of others, contractual commitments reinforce adherence to corrective practices.

Satisfactions derived from evident changes help to sustain successful endeavors, therefore, utilize *objective records of behavioral changes* as an additional source of reinforcement for their self-controlling behavior. . . .

Since behavior is extensively under external stimulus control, persons can regulate the frequency with which they engage in certain activities by *altering stimulus conditions* under which the behavior customarily occurs. Overeating, for example, will arise more often when appetizing foods are prominently displayed in frequented places in the household than if they are stored out of sight and made less accessible. . . .

Behavior that provides immediate positive reinforcement, such as eating, smoking, and drinking, tends to be performed in diverse situations and at varied times. Therefore, another important aspect of self-managed change involves progressive *narrowing of stimulus control* over behavior. Continuing with the obesity illustration, individuals are encouraged gradually to delimit the circumstances under which they eat until eventually their eating behavior is brought under control of a specific set of stimulus conditions. This outcome is achieved by having the clients commit themselves to a graduated program in which they refrain from eating in non-dining settings, between regular mealtimes, and while engaging in other activities such as watching television, reading, or listening to the radio. . . .

The foregoing procedures are primarily aimed at instituting self-controlling behavior, but unless positive consequences are also arranged the well-intentioned practices are likely to be short-lived. . .Self-control measures usually produce immediate unpleasant effects while the personal benefits are considerably delayed. *Self-reinforcing operations* are, therefore, employed to provide immediate support for self-controlling behavior until the benefits that eventually accrue take over the reinforcing function.

As a final feature of self-directed change programs, increases in desired behavior and reductions in undesired behavior are attempted gradually. In this way the incidence of experienced discomforts is kept low, and

steady progress toward the eventual goal can be achieved. [Bandura, 1969, pp. 254-257]

Change Theory

Another system of thought that has great implications for educational practice has to do with influencing the educative quality of total environments. Concepts and strategies in this system are drawn from field theory, systems theory, organizational development and consultation theories, and ecological psychology.

The systems theorists have provided conceptual frameworks for analyzing organizations of all types as complex social systems with interacting subsystems [Cleland, 1969; Kast and Rosenzweig, 1970; Parsons, 1951; Seiler, 1967; Von Bertalanffy, 1968; Zadeh, 1969]. My own interpretation of some of the applications of their work for human resources development was presented in one of my previous books.

> One of the misconceptions in our cultural heritage is the notion that organizations exist purely to get things done. This is only one of their purposes; it is their *work* purpose. But every organization is also a social system that serves as an instrumentality for helping people meet human needs and achieve human goals. In fact, this is the primary purpose for which people take part in organizations—to meet their needs and achieve their goals—and when an organization does not serve this purpose for them they tend to withdraw from it. So organizations also have a human purpose.
>
> Adult education is a means available to organizations for furthering both purposes. Their work purpose is furthered to the extent that they use adult education to develop the competencies of their personnel to do the work required to accomplish the goals of the organizations. Their human purpose is furthered to the extent that they use adult education to help their personnel develop the competencies that will enable them to work up the ladder of Maslow's hierarchy of needs from survival through safety, affection, and esteem to self-actualization.
>
> As if by some law of reciprocity, therefore, organization provides an environment for adult education. In the spirit of Marshall McLuhan's

The Medium Is the Message, the quality of learning that takes place in an organization is affected by the kind of organization it is. This is to say that an organization is not simply an instrumentality for providing organized learning activities to adults; it also provides an environment that either facilitates or inhibits learning.

For example, if a young executive is being taught in his corporation's management-development program to involve his subordinates in decision-making within his department, but his own superiors never involve him in making decisions, which management practice is he likely to adopt? Or if an adult church member is being taught to "love thy neighbor," but the total church life is characterized by discrimination, jealousy, and intolerance, which value is more likely to be learned? Or if an adult student in a course on "The Meaning of Democratic Behavior" is taught that the clearest point of differentiation between democracy and other forms of government is the citizen's sharing in the process of public policy formulation, but the teacher has never given him a chance to share responsibility for conducting the course and the institution has never asked his advice on what courses should be offered, what is he likely to learn about the meaning of democracy?

No educational institution teaches just through its courses, workshops, and institutes; no corporation teaches just through its in-service education programs; and no voluntary organization teaches just through its meetings and study groups. They all teach by everything they do, and often they teach opposite lessons in their organizational operation from what they teach in their educational program.

This line of reasoning has led modern adult-education theorists to place increasing emphasis on the importance of building an educative environment in all institutions and organizations that undertake to help people learn. What are the characteristics of an educative environment? They are essentially the manifestations of the conditions of learning listed at the end of the last chapter. But they can probably be boiled down to four basic characteristics: 1.) respect for personality; 2.) participation in decision making; 3.) freedom of expression and availability of information; and 4.) mutuality of responsibility in defining goals, planning and conducting activities, and evaluating.

In effect, an educative environment—at least in a democratic culture—is one that exemplifies democratic values, that practices a democratic philosophy.

A democratic philosophy is characterized by a concern for the development of persons, a deep conviction as to the worth of every individual, and faith that people will make the right decisions for themselves if given the necessary information and support. It gives precedence to the growth of *people* over the accomplishment of *things* when these two values are in conflict. It emphasizes the release of human potential over the control of human behavior. In a truly democratic organization there is a spirit of mutual trust, an openness of communications, a general attitude of helpfulness and cooperation, and a willingness to accept responsibility, in contrast to paternalism, regimentation, restriction of information, suspicion, and enforced dependency on authority.

When applied to the organization of adult education, a democratic philosophy means that the learning activities will be based on the real needs and interests of the participants; that the policies will be determined by a group that is representative of all participants; and that there will be a maximum of participation by all members of the organization in sharing responsibility for making and carrying out decisions. The intimate relationship between democratic philosophy and adult education is eloquently expressed in these words of Eduard Lindeman:

One of the chief distinctions between conventional and adult education is to be found in the learning process itself. None but the humble become good teachers of adults. In an adult class the student's experience counts for as much as the teacher's knowledge. Both are exchangeable at par. Indeed, in some of the best adult classes it is sometimes difficult to discover who is learning most, the teacher or the students. This two-way learning is also reflected in the management of adult-education enterprises. Shared learning is duplicated by shared authority. In conventional education the pupils adapt themselves to the curriculum offered, but in adult education the pupils aid in formulating the curricula. . .Under democratic conditions authority is of the group. This is not an easy lesson to learn, but until it is learned democracy cannot succeed. [Gessner, 1956, p. 166]

I have a suspicion that for an organization to foster adult learning to the fullest possible degree it must go even farther than merely practicing a democratic philosophy, that it will really stimulate individual self-renewal to the extent that it consciously engages in continuous self-renewal for itself. Just as a teacher's most potent tool is the example of his own behavior, so I believe an organization's most effective instrument of influence is its own behavior.

This proposition is based on the premise that an organization tends to serve as a role model for those it influences. So if its purpose is to encourage its personnel, members, or constituents to engage in a process of continuous change and growth, it is likely to succeed to the extent that it models the role of organizational change and growth. This proposition suggests, therefore, that an organization must be innovative as well as democratic if it is to provide an environment conducive to learning. Table 4-2 provides some illustrative characteristics that seem to distinguish innovative from static organizations, as I interpret the insights from recent research on this fascinating subject. The right-hand column might well serve as a beginning check list of desirable organizational goals in the dimensions of structure, atmosphere, management philosophy, decision making, and communication.

An expanding group of applicators of systems theory are developing sophisticated procedures and tools for assessing organizational health, diagnosing needs for change, feeding data back into the system for continued renewal and using the data for precision in planning. [Baughart, 1969; Bushnell and Rappaport, 1972; Davis, 1966; Handy and Hussain, 1969; Hare, 1967; Hartley, 1968; Kaufman, 1972; Optner, 1965; Rudwick, 1969; Schuttenberg, 1972]

The change theorists, building largely on the field-theoretical concepts of Kurt Lewin, have been concerned with the planning of change, the choice and use of strategies of change, organizational development, the role of the consultant and change agent, management of conflict, intervention theory, resistance to change, human relations training and the ethics of change agentry. [Argyris, 1962, 1970; Bennis, 1966; Bennis, Benne, and Chin, 1968; Blake and Mouton, 1964; Greiner, 1971; Lewin, 1951; Lippitt, 1969; Schein, 1969; Watson, 1967]

Table 4-2.
Some Characteristics of Static Versus Innovative Organizations

DIMENSIONS	CHARACTERISTICS	
	Static Organizations	**Innovative Organizations**
Structure	Rigid—much energy given to maintaining permanent departments, committees; reverence for tradition, constitution & by-laws. Hierarchical—adherence to chain of command. Roles defined narrowly. Property-bound.	Flexible—much use of temporary task forces; easy shifting of departmental lines; readiness to change constitution, depart from tradition. Multiple linkages based on functional collaboration. Roles defined broadly. Property-mobile.
Atmosphere	Task-centered, impersonal. Cold, formal, reserved. Suspicious.	People-centered, caring. Warm, informal, intimate. Trusting.
Management Philosophy and Attitudes	Function of management is to control personnel through coercive power. Cautious—low risk-taking. Attitude toward errors: to be avoided. Emphasis on personnel selection. Self-sufficiency—closed system regarding sharing resources. Emphasis on conserving resources. Low tolerance for ambiguity.	Function of management is to release the energy of personnel; power is used supportively. Experimental—high risk-taking. Attitude toward errors: to be learned from. Emphasis on personnel development. Interdependency—open system regarding sharing resources. Emphasis on developing and using resources. High tolerance for ambiguity.
Decision-making and Policy-making	High participation at top, low at bottom. Clear distinction between policy-making and policy-execution. Decision-making by legal mechanisms. Decisions treated as final.	Relevant participation by all those affected. Collaborative policy-making and policy-execution. Decision-making by problem-solving. Decisions treated as hypotheses to be tested.
Communication	Restricted flow—constipated. One-way—downward. Feelings repressed or hidden.	Open flow—easy access. Multidirectional—up, down, sideways. Feelings expressed.

[Knowles, 1970, pp 59-62]

A special focus of interest of a number of the researchers and practitioners in this field has been the use of groups as instruments of individual and organizational change. [Bradford, Benne, and Gibb, 1964; Hare, 1962 and 1969; Knowles and Knowles, 1972; Schein and Bennis, 1965; Solomon and Berzon, 1972] It is probably a defensible generalization that one of the most pronounced trends in educational practice in schools, universities, industrial and governmental training, and adult educational programs in community and voluntary agencies in the past two decades has been the increasing use of small groups.

The study of group dynamics has begun to produce some generalizations about the factors which affect the value of groups as instruments of change.

1. A group tends to be attractive to an individual and to command his loyalty to the extent that:
   a. It satisfies his needs and helps him achieve goals that are compelling to him.
   b. It provides him with a feeling of acceptance and security.
   c. Its membership is congenial to him.
   d. It is highly valued by outsiders.
2. Each person tends to feel committed to a decision or goal to the extent that he has participated in determining it.
3. A group is an effective instrument for change and growth in individuals to the extent that:
   a. Those who are to be changed and those who are to exert influence for change have a strong sense of belonging to the same group.
   b. The attraction of the group is greater than the discomfort of the change.
   c. The members of the group share the perception that change is needed.
   d. Information relating to the need for change, plans for change, and consequences of change is shared by all relevant people.
   e. The group provides an opportunity for the individual to practice changed behavior without threat or punishment.
   f. The individual is provided a means for measuring progress toward the change goals.
4. Every force tends to induce an equal and opposite counterforce. (Thus, the preferred strategy for change, other things being equal, is

the weakening of forces resisting change rather than the addition of new positive forces toward change. For instance, if a group in a factory is resisting a new work procedure, it may be because they don't understand how it will work, in which case a demonstration or trial experience will be superior to exhortation or pressure.)

5. Every group is able to improve its ability to operate as a group to the extent that it consciously examines its processes and their consequences and experiments with improved processes. (In the literature this is referred to as the "feedback mechanism," a concept similar to that used in guided missiles, which correct any deviations from their course while in flight on the basis of data collected by sensitive instruments and fed back into their control mechanism.)
6. The better an individual understands the forces influencing his own behavior and that of a group, the better he will be able to contribute constructively to the group and at the same time to preserve his own integrity against subtle pressures toward conformity and alienation.
7. The strength of pressure to conform is determined by the following factors:
   a. The strength of the attraction a group has for the individual.
   b. The importance to the individual of the issue on which conformity is being requested.
   c. The degree of unanimity of the group toward requiring conformity.
8. The determinants of group effectiveness include:
   a. The extent to which a clear goal is present.
   b. The degree to which the group goal mobilizes energies of group members behind group activities.
   c. The degree to which there is agreement or conflict among members concerning which one of several possible goals should control the activities of the group.
   d. The degree to which there is agreement or conflict among the members concerning means that the group should use to reach its goal.
   e. The degree to which the activities of different members are coordinated in a manner required by the group's tasks.
   f. The availability to the group of needed resources, whether they be economic, material, legal, intellectual, or other.
   g. The degree to which the group is organized appropriately for its task.

h. The degree to which the processes it uses are appropriate to its task and stage of development. [Knowles and Knowles, 1972, pp. 59-61]

Another source of knowledge, potentially valuable to educational practice is the emerging field of ecological psychology. Researchers in this field are studying the effects of environmental settings on human behavior and constructing a *theory of behavior settings*. The particular attributes of over- or understaffed settings have been the subject of most of their theoretical work to date. For example, in understaffed settings more people participate in more events and take more responsibility and are less evaluative of one another. Another proposition is that settings in which the participants have a heterogeneity of motives tend to be more stable than those in which there is a homogeneity of motives. [Barker, 1968 and 1963; Barker and Gump, 1964; Willems and Raush, 1969]

Characteristics of Effective Teachers

One of the more or less futile quests of educational researchers over the years has been the identification of the characteristics that distinguish excellent teachers from mediocre teachers. The problem is that the number of variables affecting the teaching-learning situation, (the students background, genetic equipment, subconscious state, motivation, aspirations) the teacher (the personality, training, educational philosophy, skill) and the environment (social, cultural, physical, administrative forces), are so great, changeable, and hard to measure and control. Stephens (1967), after looking at scores of research reports on the relationship between such variables as teacher characteristics and instructional techniques and such measures as test scores and grades on the other, concluded that practically nothing seems to make any difference in the effectiveness of instruction. Similarly, Dubin and Taveggia (1968) examined not only the conclusions but the data of nearly 100 studies made over a forty-year period and concluded that college teaching methods make no difference in student achievement as measured by

final examinations. And these are but two of a number of surveys of research that have come to similar conclusions.

The most recent survey, by N.L. Gage in 1972, paints a different picture. Gage questioned the quantitative models and the focus on teacher characteristics in previous research.

> One way to improve these models is to obtain better measures of a larger number of the teacher attributes that are significant to the ability of teachers to improve learning. Such measures will come closer to estimating the full effect of teachers, independently of home and school factors. Furthermore, these measures should be aimed at process variables—'those human actions which transform the raw materials of input into opportunities for learning' [Gagne, 1970, p. 170], i.e., teacher activities, rather than teacher characteristics such as amount of education, experience, or verbal ability." [Gage, 1972, p. 34].

Gage examined research using such process measures as the Minnesota Teacher Attitude Inventory and the Flanders' interaction categories, and found that "(a) teachers differ reliably from one another on a series of measuring instruments that seem to have a great deal in common. (b) These reliable individual differences among teachers are fairly consistently related to various desirable things about teachers." [*Ibid.*, p. 35]

Among his findings are the following:

> Teachers at the desirable end tend to behave approvingly, acceptantly, and supportively; they tend to speak well of their own students, students in general, and people in general. They tend to like and trust rather than fear other people of all kinds. [*Ibid.*, p. 35]

Flanders and Simon (1969) concluded from their examination of a dozen studies that "*the percentage of teacher statements that make use of ideas and opinions previously expressed by pupils is directly related to average class scores on attitude scales of teacher attractiveness, liking the class, etc., as well as to average achievement scores adjusted for initial ability*" (p. 1426, italics in original). Ausubel (1963, p. 171) reviewed the experiments on learning by discovery and concluded that the furnishing of completely explicit rules is relatively less effective than

some degree of arranging for pupils to discover rules for themselves. It seems safe to say that some use of the guided discovery method, and "indirectness," in teaching is desirable. [*Ibid.*, pp. 36-37]

The third dimension of teacher behavior . . . reflects the teacher's intellectual grasp, or "cognitive organization" of what he is trying to teach. [*Ibid.*, p. 37]

Our last example of a sifting of the literature to identify a desirable kind of teacher behavior is one recently provided by Rosenshine (1970). He reviewed the evidence from a variety of sources on the degree to which the teacher's "enthusiasm" was desirable. Some of the studies reviewed were experiments in which "enthusiasm" was manipulated. In other, correlational, studies, enthusiasm as it occurred "naturally" was rated, counted, or measured with an inventory. In some of the studies, the dependent variable was measured achievement; in others, evaluative ratings of the teacher by his students or other independent observers. The varied evidence seemed remarkably consistent in supporting the desirability of teacher enthusiasm. [*Ibid.*, p. 38]

These four variables—warmth, indirectness, cognitive oraganization, and enthusiasm—merely illustrate the kinds of contributions that research on teaching, in its present early stages, can support. [*Ibid.*, p. 38]

applying theories of learning and teaching to human resources development

Coping with the Different Theories

Having explored the jungle of learning and teaching theories, you have a decision to make. What do you do? You have several choices.

Ignore the Theories

For one thing, you can ignore them. You can say they are impractical. They may be all right for the pure psychological scientists and researchers, you can say, but they're too abstract and obtuse to be of much use in planning and operating day-to-day educational programs. The trouble with this choice is that it is unrealistic. The fact is that there are assumptions, concepts, and principles—theories—behind everything you do, whether you are conscious of them or not. If you are planning an educational activity in

philosophy, the arts, mathematics, machine operation, orientation of new employees, supervisory training, or management development, you are going to have to make decisions about content, techniques to be used, units of instruction and sequence, time and place, and standards for evaluation. For each decision you will be confronted with a number of options, and your choice will be determined by some idea of what will work best. That is a *theory*.

If you aren't clear about what your theory is—or even whether you have one—the chances are that you will end up with a hodgepodge. You will use different theories in different times or situations, or conflicting theories for different decisions in the same situation. You won't know why you are doing what you are doing. There is a cliche in the applied social sciences—often attributed to Kurt Lewin—that nothing is as practical as a good theory to enable you to make choices confidently and consistently, and to explain or defend why you are making the choices you make.

Pick one Theory

A second choice available is to select one theory and go with it all the way. You can, as does John Murphy in Appendix A, conclude that Skinner's operant conditioning theory makes the most sense to you, provides the clearest guidelines for program design and operation, and assures the most predictable results. Or you can conclude that the *third force* psychologists (Maslow, Rogers et al) are more in touch with human nature as it really is, and make decisions that are congruent with such concepts as self-directed inquiry, positive self-image, and self-actualization. Or you can choose any of the other theories as a workable alternative. But before you take such a big jump, check a few things out.

For example, how does the proposed theory fit your organization's management philosophy? To use Douglas McGregor's (1960) terms, if the management philosophy is Theory X, then Skinner's or any of the other mechanistic theories would fit fine. But if it is Theory Y, one of the organismic theories is indicated. For the assumptions about human nature underlying

Theory X management philosophy and the mechanistic learning-teaching models are remarkably similar, as are those underlying Theory Y management philosophy and the organismic learning-teaching models. Table 5-1 presents a comparison of the assumptions about human nature and human behavior by managers subscribing to Theories X and Y as perceived by McGregor (1960, pp. 33-34 and 47-48) with the assumptions implicit in current education and those relevant to significant experiential learning as perceived by Rogers (1972, pp. 272-279).

It seems clear that if a training program based on the assumptions in Rogers' experiential learning model is introduced into an organization employing Theory X management philosophy, a dissonance would occur that the organization would not tolerate—unless, of course, the training program is expressly being used to help bring about a change in management philosophy. Equally, if a training program which is based on Rogers' judgement of current education as is introduced into an organization employing Theory Y management philosophy, it would be resented and resisted.

Another thing to check before choosing a single theory is its congruence with the organization's long-range developmental goals. If its policy makers see it as a fairly stable, slow-changing organization whose products and processes will remain about the same for ten years, then an HRD program based upon one of the mechanistic models would be appropriate. Educational efforts would be primarily directed at reproducing in new employees the knowledge and skills of the present work force. But if the organization is fast-changing, continuously developing new products and processes, then the HRD program should be based on an organismic model.

Perhaps the fundamental distinction between these two types of organization is in how leadership views the organization as an energy system. Considering the individual as an energy system, Ira Gordon (1968) makes the comparison in Table 5-2 between the Newtonian and the Einsteinian conceptions.

The essential difference is that Newtonian physics saw energy as being mechanical, a stable source of power in an absolutely controllable, orderly universe. You get out of a machine what you put

Table 5-1
A Comparison of the Assumptions About Human Nature and Behavior Underlying Theory X and Theory Y Management Philosophy

Theory X Assumptions about Human Nature (McGregor)	Assumptions Implicit in Current Education (Rogers)
The average human being inherently dislikes work and will avoid it if he can.	The student cannot be trusted to pursue his own learning.
Because of this characteristically human dislike of work, most people must be coerced, controlled, threatened in the interest of organizational objectives.	Presentation equals learning.
The average human being prefers to be directed, wishes to avoid responsibility, has relatively little ambition, wants security above all.	The aim of education is to accumulate brick upon brick of factual knowledge.
	The truth is known.
	Creative citizens develop from passive learners.
	Evaluation is education and education is evaluation.
Theory Y Assumptions about Human Nature	**Assumptions Relevant to Significant Experiential Learning**
The expenditure of physical and mental effort is as natural as play or rest.	Human beings have a natural potentiality for learning.
External control and the threat of punishment are not the only means for bringing about effort toward organizational objectives. Man will exercise self-direction and self-control in the service of objectives to which he is committed.	Significant learning takes place when the subject matter is perceived by the student as relevant to his own purposes.
Commitment to objectives is a function of the rewards associated with their achievement.	Much significant learning is acquired through doing.
The average human being learns, under proper conditions, not only to accept but to seek responsibility.	Learning is facilitated by student's responsible participation in the learning process.
A high capacity for imagination, ingenuity, and creativity in solving organizational problems is widely, not narrowly distributed in the population.	Self-initiated learning involving the whole person—feelings as well as intellect—is the most pervasive and lasting.
Under the conditions of modern industrial life, the intellectual potential of the average human being is only partially utilized.	Creativity in learning is best facilitated when self-criticism and self-evaluation are primary, and evaluation by others is of secondary importance.
	The most socially useful thing to learning in the modern world is the process of learning, a continuing openness to experience, an incorporation into oneself of the process of change.

Table 5-2
The Individual as an Energy System

Newtonian Conception	Einsteinian Conception
Fixed intelligence	Modifiable intelligence
Development as an orderly unfolding	Development modifiable in rate and sequence
Human potential fixed though undeterminable at early ages.	Human potential creatable through transaction with the environment.
A telephone switchboard brain	A computer brain
Energy output is like that of a steam engine	
Possession of a homeostatic regulator for drive reduction	Possession of an inertial guidance and self-feedback motivational system
Inactivity until the engine is stoked	Continuous activity

into it. This conception of energy is portrayed simplistically in Figure 5-1, in which an input of one erg of energy into a system containing units of matter transforms the energy into one erg of output—less some loss from friction or heat.

In contrast, Einstein's formula $E = mc^2$ presented the idea that atoms of matter contained enormous amounts of energy which could not be released mechanically. But the input of one erg of the right kind (radiational) of energy into a system containing units of matter would excite these units to release their pent-up energy. Since this energy is uncontrollable it takes lead shields to keep it in bounds and electromagnetic fields to give it direction. This conception of energy is portrayed in Figure 5-2, in which an input of one erg of radiational energy releases (not transforms) hundreds of ergs of energy stored in its units of matter.

If an organization is thought of as an energy system, with the people in it being the units of matter on whom the energy inputs work, Figures 5-1 and 5-2 go a long way toward explaining the differences among organizations I have observed and in which I

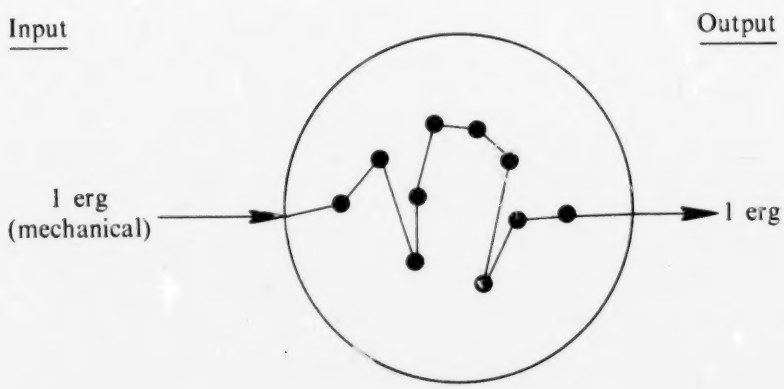

Figure 5-1. The Newtonian energy system.

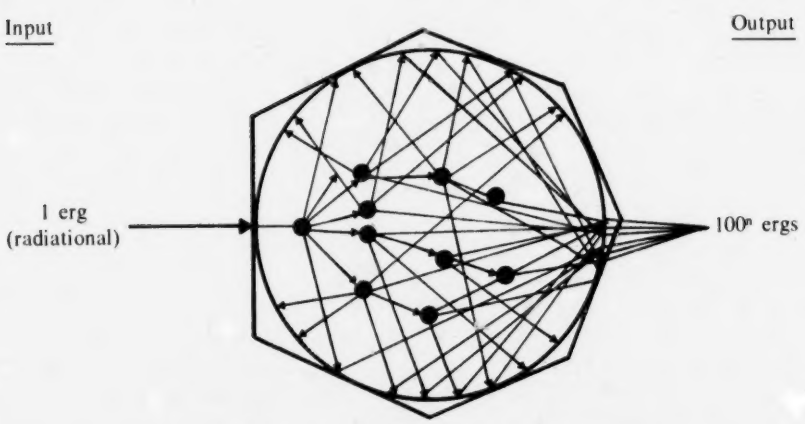

Figure 5-2. The Einsteinian energy system.

have worked. In some organizations Newtonian control of the energy of the employees is highly valued and all training is geared to assure that only prescribed behavior is learned. The function of management and supervision is to control the behavior of subordinates. In other organizations Einsteinian release of the energies of

the employees is highly valued, and all training is geared to facilitate the development of each individual to his fullest potential.

It is perhaps tempting to make a value judgment about these two kinds of organization, and to proclaim the latter as the only good one. Obviously, both kinds exist and are required. Wherever safety is involved (as in the operating room of a hospital) or absolute precision is necessary (as in an accounting department) the Newtonian model of energy-control is probably appropriate. The important thing is that the learning-teaching theory you choose be one that is congruent with the organization's type of energy system.

Pick one theory for training and one for education

Nadler, in the foundational book of this series, distinquishes between training and education. Training

> is those activities which are designed to improve performance on the job the employee is presently doing or is being hired to do. . .The purpose of training is to either introduce a new behavior or modify the existing behaviors so that a particular and specified kind of behavior results. [Nadler, 1970, pp. 40-41]

> Employee education is defined as those HRD activities which are designed to improve the overall competence of the employee in a specified direction and beyond the job now held. [*Ibid.*, p. 60].

> In an educational situation, the person likewise brings a variety of behaviors, but it is now hoped that a releasing experience is provided so that he can produce more behaviors than when he entered the situation. [*Ibid.*, p. 41]

Glaser (1962) also distinguishes between education and training and delineates two differences. Training tends to be toward specific objectives, such as operating a machine or following certain regulations, while education tends to be toward broader objectives, such as becoming a cultured gentleman or an effective manager; and training seeks a certain uniformity, a competency that can be

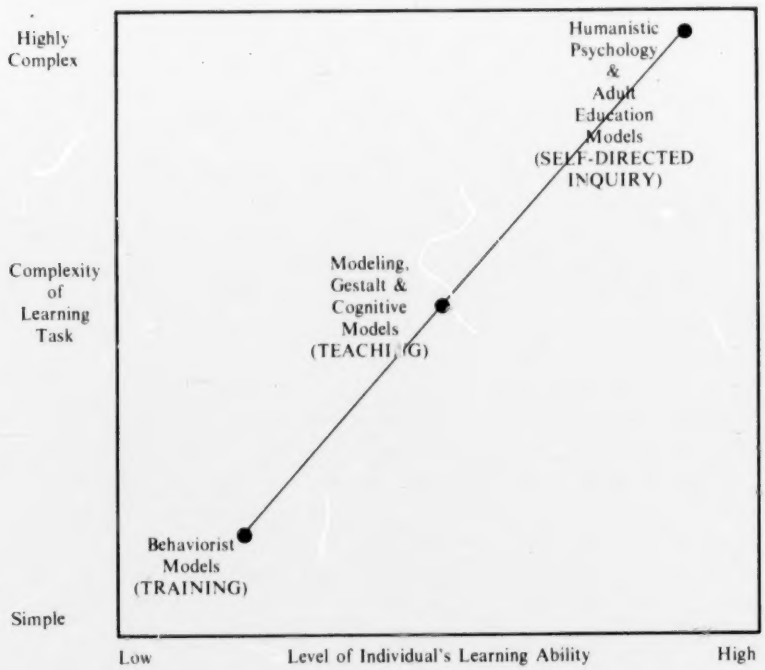

Figure 5-3. Relationship between teaching models and the learning situation.

counted upon,such as mastery of typing skills that leads to being able to type 60 words a minute, while education seeks to maximize individual differences by discovering and releasing the potential of the individual.

This kind of distinction suggests that different theories of learning and teaching might be appropriate for different kinds of learning. As we have seen previously, Gagne takes the position that there are at least eight different kinds of learning, each requiring different teaching strategies. For purposes of human resources development, Nadler's and Glaser's two-type taxonomy seems more realistic and leads to the proposition that for training, one of the mechanistic models such as programmed instruction or didactic

cognitive teaching would be appropriate, while for education an organismic adult educational model such as self-directed learning projects would be more appropriate. Perhaps different types of learning-teaching situations could be put on a continuum, as in Figure 5-3, with two criteria for identifying the appropriate teaching model: complexity of the learning task and level of individual learning ability.

This schema seems to have some merit. It provides guidelines for selecting teaching models uniquely appropriate for particular kinds of learning. But it has risks unless seen in the context of a larger theory of human resources development. For, as the humanistic psychologists emphasize, the individual is a whole person; he is not a machine at one moment (and therefore an object for behavioristic training) and a self-actualizing human being at another. I believe that the risk of the individual's being dehumanized by training and teaching situations can be minimized (1) if they are presented to him as optional steps up the ladder of self-development, and he chooses them for this purpose; and (2) provision is made in each situation for the development of learning skills that will prepare him for the next level.

Drop the education of individuals in favor of organization development.

You can take the stand that the training, teaching or self-development of individuals make little long-run difference in the productivity, morale, or effectiveness of the organization, and that therefore the energy of the human resources developer should be directed at changing the organization as a total system. Given this definition of the purpose of human resources development, learning and teaching theories geared to individual development are more or less irrelevant; theories of organizational change are what count. Because Warner Burke has recently made such a strong case for this position (although he makes room for training as part of organization development), I am letting him speak for himself in Appendix E.

I must confess that I have experienced a shift in my role as an adult educator away from managing the logistics of learning activities for collections of individuals and toward educating institutions, influencing the educative quality of whole environments. And I see a similar shift occurring in the professional work of many of my colleagues and former students. But I don't see this as an either-or dilemma; there is need for both the direct facilitation of the development of individuals and the indirect facilitation of their development through improving the educative quality of their environments.

Take the best from each theory.

> It is natural that in the early development of the relevent sciences the applied users, the technologists, will tend to be eclectic, picking up a plausible idea here and there, and using it somewhat inventively in the practical situation. [Hilgard and Bower, 1966, p. 265]

Schwab believes that there are "arts of eclectic" which contribute to the teacher's ability "to bring a multiplicity of theoretic stands to bear on the concrete case, thus ensuring a wider view of the hardships and facilitations to be expected in the course of instruction." [Schwab, 1971, p. 506].

The risks of this choice are similar to those of the first choice, ignoring the theories altogether, ending up with a hodgepodge and not knowing why you are doing what you do. Rogers has observed that "the person who attempts to reconcile [different schools of thought] by compromise will find himself left with a superficial eclecticism which does not increase objectivity, and which leads nowhere." [Rogers, 1951, p.8]

Hilgard again comes to our rescue.

> The option is still open of attempting to guide practical developments by way of one or another of the prevailing theories, or by developing some new model which has more unity than a set of eclectic 'principles.' [Hilgard and Bower, 1966, p. 565].

Here is a skeletal description of my andragogical model of human resources development. It is based on the assumptions about adults as learners presented in Chapter 3 and incorporates features of various prevailing theories that make sense to me.

An Andragogical Model of HRD

Two comprehensive treatments of the andragogical model and its application to the designing and operating of adult educational progams of vaious sorts are available: Knowles' *Modern Practice of Adult Education*, and Ingalls and Arceri, *A Trainers Guide to Andragogy*, 1972.

The main purpose here is to demonstrate how a unified model can incorporate principles and technologies from various theories and still maintain its own integrity.

The andragogical model is a *process* model, in contrast to the content models employed by most traditional educators. The difference is this: in traditional education the teacher (or trainer or curriculum committee or somebody) decides in advance what knowledge or skill needs to be transmitted, arranges this body of content into logical units, selects the most efficient means for transmitting this content (lectures, readings, laboratory exercises, films, tapes, etc.), and then develops a plan for presenting these content units in some sort of sequence. This is a *content model* (or design). The andragogical teacher (facilitator, consultant, change agent) prepares in advance a set of procedures for involving the learners (and other relevant parties) in a process involving these elements: (1) establishing a climate conducive to learning; (2) creating a mechanism for mutual planning; (3) diagnosing the needs for learning; (4) formulating program objectives (which is content) that will satisfy these needs; (5) designing a pattern of learning experiences; (6) conducting these learning experiences with suitable techniques and materials; and (7) evaluating the learning outcomes and rediagnosing learning needs. This is a *process model.* The difference is *not* that one deals with content and the other does not; the difference is that the content model is concerned with transmit-

ting information and skills whereas the process model is concerned with providing procedures and resources for helping learners acquire information and skills. A comparison of these two models and their underlying assumptions is presented in Table 5-3 in which the content model is conceived as being pedagogical and the process model as being andragogical.

Establishing a Climate Conducive to Learning

Just as we have witnessed in the past decade a growing concern for the quality of our environment for living, so during the same period there has been increasing concern among educators for the quality of *environments for learning*. From the ecological psychologists we have begun to obtain valuable information about the effects of the physical properties of environment on learning. The social psychologists have taught us much about the effects of the human environment—especially the quality of interpersonal relations. And from the industrial psychologists have come many useful insights about the effects of the organizational environment—the structure, policies, procedures, and spirit of the institution in which learning takes place.

The *Physical environment* requires provision for animal conforts (temperature, ventilation, easy access to refreshments and rest rooms, comfortable chairs, adequate light, good acoustics, etc.) to avoid blocks to learning. More subtle physical features may make even more of an impact. Ecological psychologists are finding, for example, that color directly influences mood; bright colors tend to induce cheerful, optimistic moods, and dark or dull colors the opposite.

If you are saying, "But what can I, a mere educator, do about the color of my institution?" let me share an experience I had last year. I was meeting with a class of about fifty students in a large classroom in the basement of one of our university buildings. The windows were small and transmitted very little light, so we had to have the yellow ceiling lights on all the time. The walls were painted dusty institutional beige, and two walls were ringed with black

Table 5-3
A Comparison of the Assumptions and Designs of Pedagogy and Andragogy

Assumptions			Design Elements		
	Pedagogy	Andragogy		Pedagogy	Andragogy
Self-concept	Dependency	Increasing self-directiveness	Climate	Authority-oriented Formal Competitive	Mutuality Respectful Collaborative Informal
Experience	Of little worth	Learners are a rich resource for learning	Planning	By teacher	Mechanism for mutual planning
Readiness	Biological devlopment social pressure	Developmental tasks of social roles	Diagnosis of needs	By teacher	Mutual self-diagnosis
Time perspective	Postponed application	Immediacy of application	Formulation of objectives	By teacher	Mutual negotiation
Orientation to learning	Subject centered	Problem centered	Design	Logic of the subject matter ——— Content units	Sequenced in terms of readiness ——— Problem units
			Activities	Transmittal techniques	Experiential techniques (inquiry)
			Evaluation	By teacher	Mutual re-diagnosis of needs ——— Mutual measurement of program

chalkboards. During the third meeting of the class I became conscious of the fact that this class wasn't clicking the way most classes do, and I shared my feeling of discouragement with the students. It took them no time at all to diagnose the problem as being the dolorous environment of our meetings.

One of our learning-teaching teams, agreed to experiment with our environment at the next meeting. They went to the dime store and bought brightly colored construction paper and a variety of other materials and objects, the total cost of which was under $5.00, and made collages for the walls, mobiles for the ceiling and simulated flagstones for the floor. What a happier mood characterized our fourth meeting!

Ecological psychologists also suggest that the size and layout of physical space affects learning quality. In planning the new Kellogg Centers for Continuing Education during the past two decades great emphasis has been placed on providing small discussion-group-size rooms in close proximity to larger general-session-size rooms. All of them have been provided with round, oval, or hexagon-shaped tables to encourage interaction among the learners. [Alford, 1968; Knowles, 1970, pp. 174-177] This concern for environmental facilitation of interaction among the learners is supported by the behaviorists' concept of immediacy of feedback, the importance placed on the learner's having an active role by Dewey, and the utilization of the constructive forces in groups by field theorists and humanistic psychologists. [See especially, Bany and Johnson, 1964; Bergevin and McKinley, 1965; Leypoldt, 1967]

Another aspect of the environment which all theorists agree is crucial to effective learning is the richness and accessibility of resources—both material and human. Provision of a basic learning resources center with books, pamphlets, manuals, reprints, journals, films, film strips, slides, tapes and other audio-visual aids and devices is a minimal requirement. In no dimension of education have there been more explosive developments in recent times than in educational media—closed circuit television, videotape and portable videotape machines, cassette audiotapes, technimation, teaching machines, multimedia systems consoles, a variety of information retrieval systems, amplified telephone (for telelectures),

learning center systems, language laboratories, computer-assisted instruction and commercially produced simulations and games. [See Rossi and Biddle, 1966]

The important thing is not just that these resources are available but that learners use them proactively rather than reactively—although mechanistic and organismic theorists disagree on this.

Regarding the *human and interpersonal climate* there are useful concepts from many theories. Behaviorists, although not very concerned with psychological climate, would acknowledge that it may reinforce desired behaviors, especially in motivation and transfer or maintenance of learning. An institutional climate in which self-improvement is highly approved (and even better, concretely rewarded), is likely to increase motivation to engage in learning activities. And a climate which approves and rewards new behaviors will encourage the maintenance of these behaviors especially if it allows frequent practice of these new behaviors. This is why supervisors who learn Theory Y behaviors in an outside human relations laboratory so frequently revert to Theory X behaviors after returning to a Theory X environment.

Cognitive theorists stress the importance of a psychological climate of orderliness, clearly defined goals, careful explanation of expectations and opportunities, openness of the system to inspection and questioning, and honest and objective feedback. The cognitive theorists who emphasize learning by discovery also favor a climate that encourages experimentation (hypothesis-testing) and is tolerant of mistakes provided something is learned from them.

Personality theorists, especially those who are clinically oriented, emphasize the importance of a climate in which individual and cultural differences are respected, in which anxiety levels are appropriately controlled (enough to motivate but not so much as to block), in which achievement motivations are encouraged for those who respond to them and affiliation motivations are encouraged for those who respond to them, and in which feelings are considered to be as relevant to learning as ideas and skills. They prescribe a "mentally healthful" climate. [See especially, Waetjen and Leeper, 1966]

Humanistic psychologists suggest that we create psychological climates experienced by the individuals in them as safe, caring, accepting, trusting, respectful, and understanding. The field theorists among them especially emphasize collaboration rather than competitiveness, encouragement of group loyalties, supportive interpersonal relations and a norm of interactive participation.

The andragog would include these characteristics under the heading, An Atmosphere of Adultness, but would give added emphasis to the conditions of mutuality and informality in the climate.

The notion of an *organizational climate* involves several sets of ideas. One set has to do with the policy framework undergirding the HRD program. In some organizations personnel development is relegated to peripheral status in the policy framework (and therefore, there is not much reinforcement of motivation to engage in it). But contemporary organization theorists (Argyris, Bennis, Blake, Drucker, Lippitt, Likert, MacGregor, Odiorne, Schein) assign it a central role in the achievement of organizational goals, and this is the trend among at least the largest organizations. [For examples of policy statements, see Craig and Bittel, 1967, pp. 493-506; and Knowles, 1970, pp. 308-315]

Another set of ideas regarding organizational climate has to do with management philosophy. As discussed earlier in this chapter, a theory X management philosophy provides an organizational climate that almost dictates mechanistic models of training, and a Theory Y philosophy requires an organismic (and probably humanistic) model of HRD.

A third aspect or organizational climate, closely related to the second and possibly a part of it, is the structure of the organization. A number of studies have shown that in hierarchically structured organizations there is less motivation for self-improvement and more blocks to learning (such as high anxiety) than in organizations more functionally structured such as by inter-linked work groups or by project task forces. [See Marrow, Bowers, and Seashore, 1968; Katz and Kahn, 1966; and Likert, 1961 and 1967]

Organizational climate is also affected by financial policies. At the most primary level, the sheer amount of financial resources

made available to HRD influences attitudes toward personnel development all the way down the line. When employees see that their organization values HRD highly enough to support it liberally, they are likely to value it—and vice versa. And if in times of austerity, it is the first budget to be reduced, it will come to be seen as a peripheral activity. Perhaps the ultimate signal that an organization has a deep commitment to human resources *development* is when the HRD budget is handled as a *capital investment* (like a new building) rather than as an operating cost.

Finally, a most crucial determinant of climate is the reward system. All learning and teaching theorists would jump on the S-R theorists' bandwagon in acknowledging that those behaviors (including engaging in education) that are rewarded are likely to be maintained. Accordingly, in those organizations in which participation in the HRD program is given obvious weight in wage and salary increases, promotion, and other job emoluments, the climate will certainly be more conducive to learning than in organizations in which the attitude is that learning should be its own reward.

In my own andragogical model, climate setting is probably the most crucial element in the whole process of HRD. If the climate is not really conducive to learning, if it doesn't convey that an organization values human beings as its most valuable asset and their development its most productive investment, then all the other elements in the process are jeopardized. There isn't much likelihood of having a first-rate program of educational activities in an environment that is not supportive of education.

This emphasis on organizatonal climate has grave implications for the role of the Human Resources Developer. For it implies that of the three roles Nadler assigns to him, [Nadler, 1970, pp. 174-246], by far the most critical is the role of *consultant*, within which the most critical subroles are those of advocate, stimulator, and change agent. If the human resources developer sees himself essentially as a teacher and administrator, managing the logistics of learning experiences for collections of individuals, he will have little influence on the quality of the climate of his organization. Only if he defines his client as the total organization, and his mission as the improvement of its quality as an environment for the growth and

development of people, will he be able to affect its climate. This means that he must perceive management to be a prime target in his student body, and all the line supervisors as part of his facility. In this conceptualization, training is not a staff function; it is a line function. The job of the Human Resources Developer is to help everybody be a better educator.

The theories most relevant to this set of functions are those of systems analysis [Baughart, 1969; Bushnell and Rappaport, 1972; Davis, 1966; Handy and Hussain, 1969; Hare, 1967; Hartley, 1968; Kaufman, 1972; Optener, 1965; and Schuttenberg, 1972], change theory, consultation, and intervention theory [Argyris, 1962, 1970; Bennis, 1966; Bennis, Benne, and Chin, 1968; Blake and Mouton, 1964; Breiner, 1971; Lippitt, 1969; and Watson, 1967].

Creating a Mechanism for Mutual Planning

One aspect of educational practice that most sharply differentiates the pedagogical from the andragogical, the mechanistic from the organismic, and the "teaching" from the "facilitating of learning" schools of thought is the role of the learner in planning. In the first half of each of the above pairs responsibility for planning is assigned almost exclusively to an authority figure (teacher, programmer, trainer). But this practice is so glaringly in conflict with the adult's need to be self-directing that a cardinal principle of andragogy (and, in fact, all humanistic and adult education theory) is that a mechanism must be provided for involving all the parties concerned in the educational enterprise in its planning. One of the basic findings of applied behavioral science research is that people tend to feel committed to a decision or activity in direct proportion to their participation in or influence on its planning and decision-making.

It is for this reason that the most potent HRD programs almost always have planning committees (or councils or task forces) for every level of activity: one for organization-wide programs, one for each departmental or other functional group program, and one for each learning experience. There are guidelines for selecting and utilizing these planning groups that will help to assure their being

helpful and effective rather than the ineffectual nuisances that sterotypic committees so often are [See Houle, 1960; Knowles, 1970, pp. 65-71; Shaw, 1969; Trecker, 1970].

Merely having mechanisms for mutual planning will not suffice. They must be treated in good faith, with real delegation of responsibility and real influence in decision making, or they will backfire. Avoid playing the kind of game that Skinner cites (whether with approval or not I can't quite tell) from Rousseau's *Emile*.

> Let [the student] believe that he is always in control though it is always you [the teacher] who really controls. There is no subjugation so perfect as that which keeps the appearance of freedom, for in that way one captures volition itself. The poor baby, knowing nothing, able to do nothing, having learned nothing, is he not at your mercy? Can you not arrange everything in the world which surrounds him? Can you not influence him as you wish? His work, his play, his pleasures, his pains, are not all these in your hands and without his knowing it? Doubtless he ought to do only what he wants; but he ought to want to do only what you want him to do; he ought not to take a step which you have not predicted; he ought not to open his mouth without your knowing what he will say. [Skinner, 1968, p. 260]

Diagnosing the Needs for Learning

Constructing A Model

Constructing a model of desired behavior, performance, or competencies comprises one learning need. There are three sources of data for building such a model: the individual, the organization, and the society.

To the cognitive, humanistic, and adult education (andragogical) theorists the individual learner's own perception of what he wants to become, what he wants to be able to achieve, at what level he wants to perform, are the starting point in building a model of competencies; to the behaviorists such subjective data are irrelevant. (And, incidentally, andragogs prefer *competencies*—requisite abilities or

qualities—whereas the behaviorists prefer *behavior*—manner of conducting one's self—or performance). It is not assumed that the learner necessarily starts out contributing his perceptions to the model; he may not know the requisite abilities of a new situaton. The human resources developer has some responsibility for exposing him to role models he can observe, or providing him with information from external sources, so that he can begin to develop a realistic model for himself.

Organizational perceptions of desired performance are obtained through systems analyses, performance analyses [Mager, 1972], and analysis of such internal documents as job descriptions, safety reports, productivity records, supervisors' reports, personnel appraisals, and cost/effectiveness studies.

Societal perceptions of desired performance or competencies are obtained from reports by experts in professional and technical journals, research reports, periodical literature, and books and monographs.

The model that is then used in the diagnostic process is ideally one that represents an amalgamation of the perceptions of desired competencies from all these sources, but in case of conflicting perceptions, my practice is to negotiate with the conflicting sources—usually the organization and the individual. I make no bones about the fact that there are "givens" in every situation—such as minimal organizational requirements, and that we have to accept and live with them.

Assessing Discrepancies

Another learning need involves assessing the discrepancies or gaps between the competencies specified in the model and their present level of development by the learners.

According to andragogy, the critical element in this phase is the learner's perception of the discrepancy betwen where he is now and where he wants to be. So the assessment is essentially a self-assessment, with the human resources developer providing the learner with tools and procedures for obtaining data about his level of development of the competencies. Humanistic psychologists

would urge him also to provide a safe, supportive, nonthreatening atmosphere for what could be an ego-deflating experience. Behaviorists have developed a variety of feedback-yielding tools and procedures that can be adapted to the self-assessment process.

I know of two comprehensive programs which incorporate the most advanced concepts and technologies of model-building and discrepancy-assessment: The ROCOM Intensive Coronary Care Multimedia Learning System [ROCOM, 1971] and the General Electric Corporation Career Development Program [Storey, 1972]. Other sources of information about tools and procedures for diagnosing needs for learning are Hospital Continuing Education Project, 1970, pp. 7-34; Ingalls and Arceri, 1972, pp. 20-34; Knowles, 1970, pp. 79-120 and 335-351; and Tough, 1971, pp. 63-76.

Formulating Program Objectives

At this point we hit one of the raging controversies among theorists.

Behaviorists insist that objectives are meaningless unless they describe *terminal behaviors* in very precise, measurable, and observable terms. Gagne, for example, defines an objective as. ..

> . . . a verbal statement that communicates reliably to any individual (who knows the words of the statement as concepts) *the set of circumstances that identifies a class of human performances* . . . The kind of statement required appears to be one having the following components:
>
> 1. A *verb* denoting observable action (draw, identify, recognize, compute, and many others qualify; know, grasp, see, and others do not).
> 2. A description of the *class of stimuli* being responded to [for example, "Given the printed statement $ab + ac = a\ (b + c)$"]
> 3. A word or phrase denoting *the object used for action* by the performer, unless this is implied by the verb (for example, if the verb is "draw," this phrase might be "with a ruling pen,"; if it is "state," the word might simply be "orally.")
> 4. A description of the *class of correct responses* (for example, "a right triangle," or "the sum," or "the name of the rule." [Gagne, 1965, p. 243]

Mager gives some practical guidelines for defining objectives.

1. A statement of instructional objectives is a collection of words or symbols describing one of your educational *intents*.
2. An objective will communicate your intent to the degree you have described what the learner will be DOING when demonstrating his achievement and how you will know when he is doing it.
3. To describe terminal behavior (what the learner will will be DOING):
   a. Identify and name the over-all behavior act.
   b. Define the important conditions under which the behavior is to occur (givens and/or restrictions and limitations).
   c. Define the criterion of acceptable performance.
4. Write a separate statement for each objective; the more statements you have, the better chance you have of making clear your intent.
5. If you give each learner a copy of your objectives, you may not have to do much else. [Mager, 1962, p. 53]

Moving up the scale from the behaviorists, Taba—with a more cognitive orientation—gives "principles to guide the formulation of objectives."

A statement of objectives should describe both the kind of behavior expected and the content or the context to which that behavior applies.

Complex objectives need to be stated analytically and specifically enough so that there is no doubt as to the kind of behavior expected, or what the behavior applies to.

Objectives should also be so formulated that there are clear distinctions among learning experiences required to attain different behaviors.

Objectives are developmental, representing roads to travel rather than terminal points. [Note that at this point she departs sharply from the behaviorists.]

Objectives should be realistic and should include only what can be translated into curriculum and classroom experience.

> The scope of objectives should be broad enough to encompass all types of outcomes for which the school [program] is responsible. [Taba, 1962, pp. 200-205]

In elaboration on her last point, Taba develops a classification of objectives by types of behavior.

> Knowledge (facts, ideas, concepts)
> Reflective thinking (interpretation of data, application of facts and principles, logical reasoning)
> Values and attitudes
> Sensitivities and feelings
> Skills [Taba, 1962, pp. 211-228]

Building on the thinking of Tyler (1950), as did Taba, Houle identifies these attributes of objectives.

> An objective is essentially rational, being an attempt to impose a logical pattern on some of the activities of life.
> An objective is practical
> Objectives lie at the end of actions designed to lead to them.
> Objectives are usually pluralistic and require the use of judgment to provide a proper balance in their accomplishment.
> Objectives are hierarchical.
> Objectives are discriminative.
> Objectives change during the learning process. [Houle, 1972, pp. 139-142]

He goes on to give guidelines for stating objectives.

> Educational objectives may be stated in terms of the desired accomplishments of the learner.
> Educational objectives may also be stated in terms of the principles of action that are likely to achieve desired changes in the learner.
> The understanding and acceptance of educational objectives will usually be advanced if they are developed cooperatively.
> And objective should be stated clearly enough to indicate to all rational minds exactly what is intended.

> In many teaching and learning situations, but particularly in those sponsored by institutions, objectives can be stated not only in terms of the outcomes of education but also in terms of changes in the design components which will presumably make those outcomes better. (facilitative objectives) [Houle, 1972, pp. 147-149].

Theorists who see learning as a process of inquiry expressly (and sometimes rather vehemently) reject the idea that there should be pre-set or prescribed objectives at all. Schwab, for example, takes an unequivocal position.

> Educators have long been accustomed to ask at this point in a curricular discussion, "What is the intended outcome?" The question arises from the dogma that curriculums should be devised, controlled, and evaluated in the light of "objectives" taken as the leading principles. Consideration of the practical character of curriculum and instruction convinces me that this dogma is unsound. . . . I do not intend or expect one outcome or one cluster of outcomes but *any one* of several, a plurality. Recognizance of the several stems from consideration not of possible outcomes, but of the materials under treatment: pluralities of theory, their relations to the matter they try in their various ways to subsume, their relations to one another. [Schwab, 1971, p. 540]

Tough (1971), in his analysis of how adults actually engage in independent learning projects, found that goals tended to emerge organically as part of the process of inquiry, with various degrees of clarity and preciseness, and to be continuously changing, subdividing, and spawning offspring.

Maslow, with his conception of self-actualization as the ultimate aim of learning, also sees goal-formation as a highly dynamic process occurring through the interaction of the learner with his experience.

> As might be expected, such a position has certain implications for helping us to understand why conventional education in this country falls so far short of its goals. We can stress only one point here, namely, that education makes little effort to teach the individual to examine reality directly and freshly. Rather it gives him a complete set of

> prefabricated spectacles with which to look at the world in every aspect, e.g., what to believe, what to like, what to approve of, what to feel guilty about. Rarely is each person's individuality made much of, rarely is he encouraged to be bold enough to see reality in his own style, or to be iconoclastic or different. [Maslow, 1970, p. 223]

Other theorists focus primarily on developing the skills of self-directed inquiry, holding that all other substantive learning objectives flow from the process of accomplishing this one. [Allender, 1972, pp. 230-238; Appendix E]

Perhaps these differences in viewpoint on objectives are partly reconcilable by assigning the more terminal-behavior-oriented procedures to training and the more inquiry-process-oriented procedures to education, much the way we handled teaching models in Figure 5-3. Even then, according to andragogical theory, the learner is likely to resist unless he freely chooses them as being relevant to his self-diagnosed needs. Among the most helpful treatments of the process of formulating objectives in adult education are Hospital Continuing Education Project, 1970, pp. 35-46; Houle, 1972, pp. 136-150 and 200-212; Ingalls and Arceri, 35-42; and Knowles, 1970, pp. 121-128.

Designing a Pattern of Learning Experiences

To the behaviorists program design is essentially a matter of arranging contingencies of reinforcement so as to produce and maintain the prescribed behaviors—as sketched by Murphy in Appendix A. To cognitive and inquiry theorists it is a matter of arranging a sequence of problems that flow according to organic stages of development, and providing appropriate resources for the solving of these problems by the learner. [Bruner, 1966, pp. 71-112; Suchman, 1972, pp. 147-159] To the *third force* psychologists it is a matter of providing supportive environments (usually relatively unstructured groups) in which the participants (learners and trainers together) can help one another grow in existentially determined directions. [Rogers, 1969]

Adult education theorists have tended to build design models into which aspects of all these approaches can be fitted. The three most recent are by Knowles, Tough and Houle (in order of publication). The andragogical design model involves choosing problem areas that have been identified by the learners through self-diagnostic procedures and selecting appropriate formats (individual, group, and mass activities) for learning, designing units of experiential learning utilizing indicated methods and materials, and arranging them in sequence according to the learners' readiness and aesthetic principles. [Ingalls and Arceri, 1972, pp. 43-49: Knowles 1970, pp. 129-159]

Tough (1971) employs the concept of a *learning project* consisting of a series of related *episodes* as his basic framework for program design. A program would consist of a number of simultaneous individual and group learning projects, each project having been collaboratively planned by learners and selected helpers and carried on at the learners' initiative. The learners could use the whole gamut of human resources (experts, teachers, colleagues, fellow students, people in the community) and material resources (literature, programmed instruction devices and software, and audio-visual media) almost without regard for the theoretical orientation underlying them. Even the most didactic teacher or linear teaching machine program will be used proactively rather than reactively by a self-directed learner.

Houle (1972) has developed a fundamental system of educational design which was described in outline in Chapter 4 and is recapitulated in graphic form in Table 5-4 and Figure 5.

One final observation about program design flows from these adult educatonal models. They assume a high degree of responsibility for learning to be taken by the learner; in the andragogical and learning projects models, especially, the entire systems are built around the concept of self-directed learning. But by and large, the adults we work with have not learned to be self-directing inquirers; they have been conditioned to be dependent on teachers to teach them. And so they often experience a form of culture-shock when first exposed to truly adult educational programs.

Table 5-4
Major Categories of Educational Design Situations

Individual
An individual designs an activity for himself An individual or a group designs an activity for another individual
Group
A group (with or without a continuing leader) designs an activity for itself A teacher or group of teachers designs an activity for, and often with, a group of students A committee designs an activity for a larger group Two or more groups design an activity which will enhance their combined programs of service
Institution
A new institution is designed An institution designs an activity in a new format An institution designs a new activity in an established format Two or more institutions design an activity which will enhance their combined programs of service
Mass
An individual group, or institution designs an activity for a mass audience

Source: Cyril O. Houle, *The Design of Education* (San Francisco: Jossey-Bass, 1972), p.44.

For this reason, I am increasingly building into my designs of programs for new entrants a preparatory *learning-how-to-learn* activity. This activity may range from an hour to a day in length, depending upon the length and intensity of the total program, and consists of the following elements:

First, a brief explanation of the difference between proactive and reactive learning, along the lines presented in Appendix F.

Second, a short experience in identifying the resources of the participants (who knows what, or has had experience doing what) and establishing collaborative, I-Thou (rather than It-It) relationships with one another as human beings. For this exercise I use groups of four or five participants.

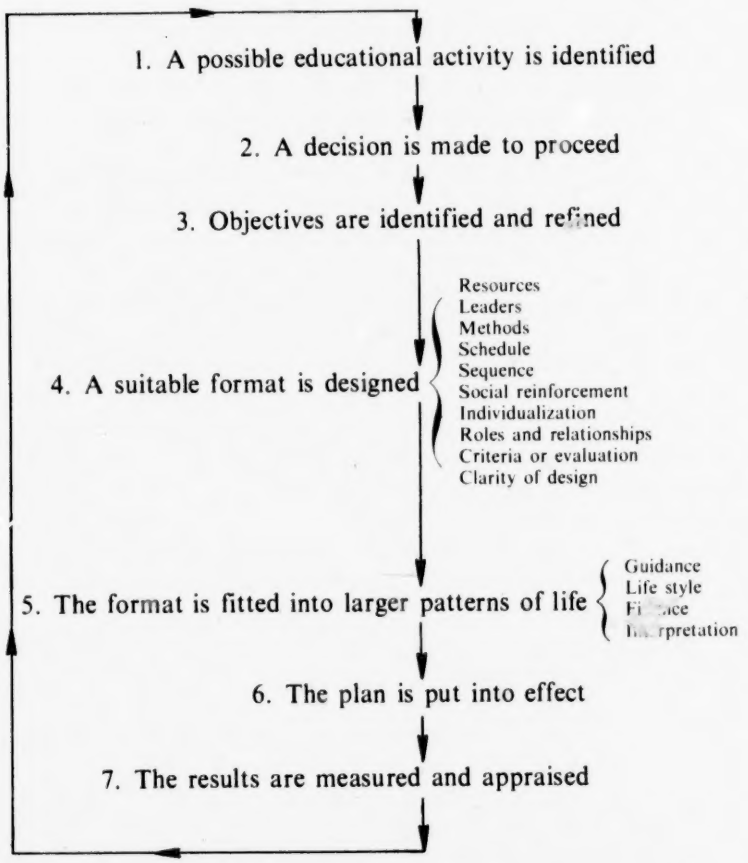

Figure 5-4. Houle's fundamental system: decision points and components of an adult educational framework. (Houle, 1972. p. 47).

Third, a miniproject in using the skills of proactive learning described in Appendix F, such as reading a book proactively, or using a supervisor proactively.

It has been my experience that even a brief experiential encounter with the concepts and skills of self-directed learning help adults to feel more secure in entering into an adult educational program.

Operating the Program (Conducting Learning Activities)

This element of the program development process is concerned focally with the human resources developer's role as administrator, and learning-teaching theories have very little to say about this role. Nadler, [1970, pp. 202-231] describes the functions associated with this role, and ideas about how to carry them out andragogically are developed in Ingalls and Arceri, 1972, pp. 54-62 and Knowles, 1970, pp. 161-218.

I see the centrally crucial factor in program operation to be the quality of faculty resources. The current manpower sources for teachers of HRD activities contain people who only know how to teach in the traditional pedagogical fashion, since this is the way they were taught to teach. You can't rely very much on selection procedures to provide you with good teachers. You have to train them yourself, through both preservice and inservice educational programs. I would say that the single most critical aspect of your role as program administrator is your function as a developer of human resources development personnel. [See Knowles, 1970, pp. 166-174 and 363-369]

Evaluating the Program

Here is the area of greatest controversy and weakest technology in all of education, especially in adult education and training. As Hilgard points out regarding educational technology in general, "*It has been found enormously difficult to apply laboratory-derived principles of learning to the improvement of efficiency in tasks with clear and relatively simple objectives. We may infer that it will be even more difficult to apply laboratory-derived principles of learning to the improvement of efficient learning in tasks with more complex objectives.*" [Hilgard and Bower, 1966, p. 542, italics in original] This observation applies doubly to evaluation, the primary purpose of which is to improve teaching and learning—not, as so often misunderstood, to justify what we are doing. One implication of Hilgard's statement is that difficult as it may be to evaluate training, it is doubly difficult to evaluate education.

Donald Kirkpatrick's [Craig and Bittel, 1967, pp. 87-112; Kirkpatrick, 1971, pp. 88-103] conceptualization of the evaluation process is the most congruent with andragogical principles and the most practical of all the formulations seen to date. He conceives of evaluation as four steps, all of which are required for an effective assessment of a program.

The first step is *reaction evaluation*, getting data about how the participants are responding to a program as it takes place—what they like most and least, what positive and negative feelings they have. These data can be obtained through end-of-meeting reaction forms, interviews or group discussions. It is usually desirable to feed back data from one session at the beginning of the next session, so that indicated program modifications can be negotiated.

The second step is *learning evaluation*, which involves getting data about the principles, facts, and techniques which were acquired by the participants. This step should include both pretests and posttests, so that specific gains resulting from the learning experiences can be measured. Performance tests are indicated (such as operating a machine, interviewing, speaking, listening, reading, writing, etc.) for skill learning. Either standardized or tailor-made information-recall tests or problem-solving exercises can be used to gauge knowledge. Such devices as attitudinal scales, role playing or other simulations, or critical-incident cases may yield helpful progress in attitute-learning.

The third step is *behavior evaluation*, requiring data such as observers' reports about actual changes in what the learner does after the training as compared with what he did before. Sources of this kind of data include productivity or time-and-motion studies. observation scales for use by supervisors, colleagues, and subordinates, self-rating scales, diaries, interview schedules, questionnaires, etc.

The fourth step is *results evaluation*, data for which are usually contained in the routine records of an organization—including effects on turnover, costs, efficiency, frequency of accidents or grievances or tardiness or absences, quality control rejections, etc.

The main difficulty in evaluation, as in research, is in controlling the variables sufficiently to be able to demonstrate that it was the

training that was mainly responsible for any changes that occurred. For this reason, Kirkpatrick recommends using control groups whenever possible.

All learning and teaching theorists acknowledge the importance of evaluation. Behaviorists maintain that evaluation is built into their very process—when a learner makes an error in a frame of a teaching machine program it shows up immediately and corrective action is taken and if a program doesn't produce the prescribed behavior, it is modified until it does. They insist that evaluation is intrinsic to their process—not something that happens at a different time from learning. To some degree, Kirkpatrick's *reaction evaluation* employs this principle.

Cognitive theorists stress the importance of the learner's ability to retrieve and apply information to new problems as the key to evaluation, which is what *learning evaluation* is essentially about. Field theorists and humanistic psychologists emphasize the translation of learning into behavior back home or in the field (the humanists, or course, stressing self-actualizing behavior), which is the purpose of *behavior evaluation.* Organization theorists point out that unless desirable results can be demonstrated, management will withhold support from training—which is the essence of *results evaluation.*

I should like to add a fifth deminsion which springs directly from the fundamental conception of adult education as continuing education—*rediagnosis of learning needs.* If every learning experience is to lead to further learning, as continuing education implies, then every evaluation process should include some provision for helping the learners re-examine their models of desired competencies and reassess the discrepancies between the model and their newly developed levels of competencies. Thus repetition of the diagnostic phase becomes an integral part of the evaluation phase.

The Evolving Meaning of Human Resources Development

As I see it, Human Resources Development is more than just a higher sounding name for what we have always done. It is *not* just a

synonym for training or in-service education or management development or even for manpower development. If it were only this, one or more of the traditional learning theories would serve.

I am beginning to visualize Human Resources Development as something deeper and more comprehensive than any of these concepts, and I hope that this book will stimulate others to sharpen the vision—a vision that includes McGregor's and Likert's (and others') conception of all organizations as human enterprises in their most vital essence. It includes the conception of systems theorists and organization development theorists of an organization as a dynamic complex of interacting subsystems of people, processes, equipment, materials, and ideas. It includes the conception of modern economic theorists that the input of human capital is an even more critical determinant of organizational output than material capital. It also includes the nuclear physicists' conception of an energy system that is infinitely amplifiable through the releasing of energy rather than the control of energy. It envisions the role of the Human Resources Developer as being perhaps more crucial than any other role in determining which organizations will be alive twenty years from now and which will be extinct.

And as this happens, the Human Resources Developer must radiate the confidence increasingly of a pro. It will no longer suffice to be a good learning specialist, a good administrator, and a good consultant. He or she will have to know more than learning specialists, administrators, and consultants know. He will have to know a new theory of human resources development. And for him to be able to know it, you and I had better work hard at building it now.

I have tried to make at least a beginning with andragogy. How about you?

appendix a. is it skinner or nothing?

The public response to B.F. Skinner's *Beyond Freedom and Dignity*[1] reveals a good deal more about the public than it does about Skinner or this work; and it reveals a good deal more about management's perceptions of training than you and I can afford to ignore.

The response has been more extensive, more uniformly antagonistic and more intensely stated than that touched off by any other book during 1971. Skinner has been the subject of a *Time* magazine cover story, a *New York Times* interview, editorial and cover book review, a *Newsweek* education column and countless other reviews. He has guest-appeared on Today, Dick Cavett, David Frost, Firing Line, and CBS Morning News. The book was widely circulated as a condensation in *Psychology Today*. The American Psychological Association gave him its annual award. *Time* quoted his colleagues' description as "the most influential psychologist in the country." The book has been number 3 on the best-seller list. But you get the idea.

This would be a remarkable achievement for any semi-technical book, but on top of that:

- The author has been almost entirely out of the public limelight since the early 1960's.

- What image did survive associated ("pigeon-holed?") him with "short step/immediate-feedback," dull rote learning, and the replacement of tail-fins by teaching machines as the nation's hardware sex symbol. Who among us has not damned him with the faint praise, "Well, at least we learned to specify behavioral objectives out of that PI thing."
- The targets of the most heated attacks are positions which Skinner presented (and presented more forcibly) years ago.

Any one of these should have given publisher Alfred Knopf great qualms. But against these odds the spectacular commercial success and critical reaction has occurred, and that suggests that somehow Skinner has struck a sensitive nerve. But this extraordinary emotional reaction has diverted attention away from the only issues that makes much practical difference *today*: How much of it is relevant to training? How much of it works? Under what conditions?

To answer that we need to examine:

1. Skinner's fundamental position on *the* cause of behavior (because that will be the acid test of your willingness to implement principles of learning which he derives from it).
2. The most consistent critical reactions (because they are the objections you and I will also encounter) and an imputed Skinnerian rebuttal (because we can't overcome those objections with just our own fancy footwork).
3. The principles of learning which he has developed experimentally and what they tell us about designing training (because if we can't use this technology to increase our reliability in predicting and delivering behavior, we are not about to go very far in the business world).

Skinner on Learning

At a Training Research Forum seminar in 1971, Dr. Skinner brought literally every learning principle he has ever stated back to a six-word premise:

'Behavior Is Determined by Its Consequences'

Period. That's it. Either you buy that or you don't. If you don't, stop reading—there is not much here you can use effectively. If you do, then the other controversial, painful conclusions in *Beyond Freedom and Dignity*

follow inescapably from it. Perhaps a lot of the emotionalism about behaviorism springs from discomfort with that unforgiving go/no-go switch. Even if you say, "I believe that *some* behavior is determined by its consequences," the kindly doctor will shoot from the hip with five quick questions and you're dead—shot with your own bullets. "Face it," the man says, "Thursday's behavior is caused by Wednesday's consequences of Tuesday's behavior?

If behavior is determined by its consequences, then the way to change behavior is to change the consequences and rearrange the "*contingencies* of the reinforcement." The question is not only "what *is* the consequence," but "in what way (by what contingency) is the consequence (reinforcement) *related* to the behavior?"

This represents a significant change in emphasis for Skinner, and in fact, much of the current criticism is still aimed at the "stimulus-response" straw-man of the early 1960's. He is concerned by that misperception, because it clouds what he now sees as a more critical concept, the role of *consequences* as the only real shaper of behavior. He now emphasizes that "Learning does not occur because behavior has been primed (stimulated); it occurs because behavior, primed or not, is *reinforced*."

Critics on Skinner

Unfortunately, the critical response to the book has focused on the academic issue of whether man is inherently autonymous and whether it is ethical to "manipulate" him (just in case it turns out he wasn't autonymous after all). That focus is unfortunate, because the argument leads nowhere and draws attention away from the real issue:

> what evidence is there that behavior is controlled by its consequences, and how can that make us more effective in helping people to learn, and more reliable when we make commitments to develop a specific level of human performance?

Time's definition of behavioral technology may be the most rational summary statement made by the press: "Behavioral technology is a developing science that aims to change the environment rather than people, that seeks to alter actions rather than feelings, and that shifts the customary psychological emphasis on the world inside men to the world outside them."[2]

But from that point on, there is a high content of emotional static because "Skinner's program runs counter to the traditional humanist im-

age of man as an autonymous individual possessed of a measure of freedom and personal dignity."[3] Novelist Arthur Koestler's not-very helpful response is typical: "(Behavioral technology is)... a pseudo-science... a monumental triviality that has sent psychology into a modern version of the dark ages."[4] You do have to agree that, if the Koestlers see that much power in behavioral technology as a "triviality," it's certainly understandable that they would not want to recognize it as having any great substance.

The most consistent specific criticisms seem to derive from the autonomy hang-up:

1. "You shouldn't have to bribe or manipulate people with frequent and scheduled bursts of reinforcement." Skinner attributes much of the criticism of his work, and, for that matter, much of the ineffectiveness of our social programs, to the non-scientific concept, "should." John Cline, project director for Project Alpha (one of the performance contracts in public education) expressed his own exasperation with criticism of his use of rewards in the classroom to reinforce learning: "We hear from people that the kid should *want* to succeed. Well, goddamn yeah, he *should*. But he *doesn't*."[5]
2. "People aren't pigeons."
   As far as I know, Skinner has never admitted to an inability to discriminate people from pigeons. What he does say is that "what is common to pigeon and man is a world in which certain contingencies of reinforcement prevail. The schedule of reinforcement which makes a pigeon a pathological gambler is to be found at a racetrack and a roulette table—where it has a comparable effect."[6]
3. "Even if there is some validity to Skinner's position, he makes it impossible to deal with because he insists that his is the only truly scientific way to study behavior and learning."

   Well, Skinner argues, what are its alternatives? "Let's evaluate behavioral technology... only in comparison with what is done in other ways. What, after all, have we to show for non-scientific good judgment or common sense or the insights gained through experience?" If you believe, with Skinner, that we have here the rudiments of a new science-based technology, then is there any more reason to accept *other* explanations for his experimentally-derived results than the physicist has for agreeing with Aristotle's view that an object falling toward earth increases its velocity because it became

more "jubilant" as it neared the ground? Once you have documented the relationship between behavior and its consequences, can you allow for other superstitions and theories which propose undocumented counter positions.

But then, even the critic goes on to say that "the most terrifying thing about Skinner's claim is that he is probably right . . . the behavioral technology capable of eliminating man's inner core of subjectivity is for all practical purposes currently available."[7]

4. "Even though man is autonymous and can't be controlled by others, it's still unethical to do so."

Skinner takes the usually acceptable scientific position that he is merely a systematic observer of what is already going on, the everyday reality which is already much as he describes it. People may be unaware of what they are doing, but conditioning and reconditioning of behavior is going on all the time. "The fundamental mistake" which he attributes to the humanists and inner-man devotees, "is to assume that their methods leave the balance of control to the individual, when in fact they leave it to other conditions."

What's in It for Us Training Types?

Two things:

- We need to get better operational control of Skinner's conclusions about how people learn, because we're not going to become reliably productive in the business world until we do.
- Skinner's critics have done us a service, by verbalizing in a cogent manner the partially-hidden assumptions our top-management people often have about the whole concept of planned behavior change.

Trainers and Unreliability

Seven years have slipped away since Colonel Ofiesh asked, "Can the science of learning be applied to the art of pedagogy?. . .Can the studies of learning be applied to training and education? . . . the effort to apply what we know (?) about learning to the art of teaching has been a colossal failure."[8] And I would argue that we're not much further ahead in 1972.

Let's stop looking at this as a rhetorical question—it isn't. The value of a science is that it permits one to predict outcomes. In the corporation, the

success of the marketing or production vice president is based on his ability to predict (budget) and deliver some quantified economic value. The issue of whether he does so on the basis of "science" doesn't come up because he usually predicts tolerably well and seldom is asked to produce a scientific basis for his prediction. If we want to play with the big boys, the name of the game is *predict* (i.e., take accountability for) results and deliver. By and large, we can't do that very well now, and the only light spot on the horizon I see is the opportunity to harness learning theory. If we don't soon command some learning theory and its applications to reliable predictions, we've got about the same chance of getting management to entrust the training department with vital responsibility as has the employees' picnic committee.

Aside from the emotional fluff, what is there in Skinner's work that the trainer can use to increase his reliability and effectiveness? Back to catechism lesson one:

'Behavior Is Determined by Its Consequences'

The progression of logic continues as follows:

1. Behavior change (learning) can be achieved only by changing the consequences and their contingent relationship with the behavior in question.
2. The task of teaching thus becomes arranging contingencies of reinforcement.
3. The role of training in an organization can then be defined:

> Training is the function in an organization which identifies, develops and maintains those behaviors required for the organization to reach its goals. Where changes in behavior are required, they are achieved by arranging the contingencies of reinforcement under which people learn. This may be accomplished through traditional training programs, or through changes in the operating system if that happens to be where the controlling contingencies are located. This function may be dispersed throughout the organization (to line supervisors, to other staffs, etc.) depending on their natural access to the contingencies involved.[9]

4. Learning manifests itself only when an organism modifies its behavior in response to a given stimulus.

5. Learning proceeds with three kinds of responses:
   a. Discrimination (between classes)
   b. Concept formation (i.e., generalization among classes based on similarity of some characteristic).
   c. Chaining (a series of responses in which the reinforcer of one response becomes the stimulus for the next response).
6. Behavior which has reinforcing consequences (reward) is more likely to occur again.
7. Behavior which has aversive consequences (punishment) is less likely to occur again; but the relative power of punishment in changing behavior is miniscule compared with the power of positive reinforcement.
8. Behavior which goes unreinforced is eventually extinguished.
9. Confirmation to the learner that he has modified his behavior toward a desired outcome is reinforcing to him.
10. The major difference between learners is the rate at which learning occurs, not the way in which it occurs.
11. One of the critical contingencies is the time lapse between behavior and its reinforcement. When the consequences of behavior occur immediately, the chances of that behavior occuring again are greater than if there is a delay of as little as one day. "No one is ever actually reinforced by remote consequences, but rather by mediating reinforcers which have acquired their power through some connection with them." Since most of the reinforcers in the business world are not very immediate (compensation, promotion, formal acclaim), a central task of training is to *mediate the remote reinforcers* (make the ultimate consequences of behavior more immediate).

    For example, the ultimate reinforcer of newly-trained selling behavior is sales closed and other follow on rewards. Usually these occur some days after the behavior is introduced in the sales training session, and are relatively weak reinforcers of behavior occuring in training. A Skinnerian solution would be to simulate reality by paying the salesman off in cash or other tangible values right in the training setting as he exhibits each new approximation to the desired behavior.

    In fact, we could generalize from this to say that Skinner's approach to the problem of transfer would put the highest emphasis on simulating the job situation—its stimuli, its reinforcers, the con-

tingency relationship between response and consequence, and any other important inputs to the individual in that job.

Communications skills are often "taught" by taking the trainee through an example or a role play. The trainee may indeed engage in the behavior which someone defines as "effective communication," but "if the behavior is entirely under the control of the instructor or role partner, it is probably not being brought under the control of stimuli which will be encountered in similar problems on the job."

12. While the *transfer* of behavior to the job depends on bringing it under the control of stimuli in training that are similar to those on the job, the need to provide for the *maintenance* of that behavior over long periods of time imposes another requirement. Even if the learner's supervisor is supportive of the new behavior, he is not a very reliable reinforcer for two reasons:

First, he has neither the skills nor the time to discriminate and reinforce the desired behavior on an effective schedule.

Second, his predictability as a reinforcer is pretty shaky because his own behavior will change in response to the effect his reinforcement has on the learner. The supervisor and learner may start an escalation of mutual reinforcement that is impossible to predict and allow for.[10]

Because of this, Skinner stresses the importance of "making a person dependent on *things* rather than on other people." In other words, build into the environment mechanisms which are triggered when reinforcible behavior occurs. For a salesman, for example, the ideal built-in reinforcer would be a firm order on those calls in which he uses the appropriate behavior. That ideal can in fact be realized if the salesman has been prepared in training to maintain the behavior even if it is reinforced in only a small percent of the occasions in which he uses it.

Where the sales trainer lacks the confidence to rely on that ideal situation, others must be built in. If, for example, the salesman files a written contact report on each call, he might indicate the calls on which he felt he had done a better than usual job of using the particular skill. The sales managers' secretary could be trained to recognize reinforcible reports (a far simpler task than recognizing the degree of the behavior itself). She would flag it for the sales manager who would send it back to the salesman with a short com-

ment recognizing the specific behavior and encouraging him to continue and develop its use.

13. In addition to the accuracy and immediacy of the reinforcement, the other major contingency is the "*schedule* of reinforcement." This concept recognizes that it is impractical (and often undesirable) to reinforce *every* appropriate response, and offers several alternative schedules of the relationship between behavior and reinforcement. Two special situations are worth knowing about:

The Variable-Ratio Schedule

This is the gambler's schedule and the most powerful of all behavior shapers. Reinforcement of the desired behavior occurs randomly. Since the learner does not know which response will be reinforced, he will make the response (put the quarter in the slot machine or keep each production unit within specs) many, many times regardless of the infrequency of reinforcement (a jackpot or a satisfactory quality control check). He is "hooked" as they say, and a bare minimum of reinforcement will sustain that behavior for long periods of time.

Stretching the Ratio

This technique ought to be a central objective of any training design. It also deals with the problem of sustaining behavior on the job with the relatively small number of reinforcements available there, as opposed to the 1-1 ratio which is possible in the training situation. Stretching the ratio means that the 1-1 training ratio is gradually stretched to 5-1 or 100-1, or whatever approximation of the job condition can be achieved—*before the learner leaves the training experience.*

14. And this gem: "To *acquire* behavior, the learner must *engage* in behavior." Read that one again.

Applications to Training Design

These learning principles can be used to design and evaluate training by examining the following variables:

1. The stimuli presented on the job.
2. The responses to those stimuli.
3. The consequences of those responses.
4. The contingencies of reinforcement/consequences (their relationship to the response).
5. Items 1—4 in the *training* experience.
6. Items 1—4 in the redesigned job situation.

The questions the behaviorist asks about these variables include:

1. Are the descriptions of each element clear enough to discriminate whether or not it has occurred?
2. Do the elements in the learning situation approximate as closely as possible those of the redesigned job situation?
3. To the extent that the training stimulus and response cannot simulate the work stimulus and response, does the training develop behavior which will enable the worker to adapt to these discrepancies on the job?
4. Have the punishing or interfering consequences of the behavior on the job been minimized?

A Way To Begin

Probably the most successful application of reinforcement theory with dollar payoff has been the work of Ed Feeney, Vice President, Systems Performance, at Emery Air Freight. Feeney's process and spectacular results have been documented elsewhere for ASTD members. For our purpose, a short probing sequence which is the key to his success is a good starting point. Given evidence that some specific performance indicator needs to be improved, Feeney asks:

1. What is the standard of performance?
2. Does the employee know the standard?
3. How well does the employee *think* he is doing?
4. How well does his supervisor think he is doing?
5. What aversive consequences of the desired behavior may be suppressing it?
6. What is reinforcing the undesired behavior?
7. What natural or contrived reinforcers are at hand in the immediate work environment to begin reinforcing the desired behavior?

8. What aversive consequences of the undesired behavior are at hand?
9. What learner responses are already available in embarking on a program of progressive approximation to the desired behavior?
10. What schedule of reinforcement is most efficient for developing and maintaining the desired bahavior?
11. What reinforcers are available to reward the worker's supervisor for reinforcing the worker's new behavior?

An important benefit of this approach is that it sidesteps the philosophical issue about autonymous man. It comes across as a straightforward, workmanlike business problem analysis. If the jargon is left out, managers don't feel uncomfortable in proceeding this way, and Emery Air Freight has over $2,000,000 in increased profit, tied directly to this approach, to prove it.

Autonomous Man and Your Chief Executive Officer

Not all company situations, however, will let you get that far without raising the issue of whether man is or ought to be controlled by things outside himself. If an organization has been infected by the "motivation" virus it will be more difficult to overcome the religious fervor about "building a fire under a man" to get him to "realize his potential," and like that.

I like Tom Gilbert's analysis:

> "These programs have been sold through articulate and appealing rationales. Mostly, their appeal has been the historical appeal of the "psychology of personality"—theories about the "inner man." They promise to show the executive how to better understand the basic and innermost motives and attitudes of himself and others—and they also seem to promise that such intimate knowledge will lead the executive to being a more effective manager. The appeal of motivational hierarchies, sensitivity training, attitudes that can be plotted on a grid, and the like, has been similar to the appeals of psychoanalysis and religion—these programs really began with Freud and modern theologists who have promised power and peace through inner knowledge. But if the appeal has been as great, the success is equally hard to evaluate. . . We don't get very far by choosing attitudes and inner motives as variables, not because those things don't exist, but because we can't directly manipulate them—and perhaps we have no business trying to. Thus, we look to what we can directly affect: a man's environment. . .his patterns of reinforcement, the feedback of informa-

tion, those events that interfere with his performance, and the quality of the stimuli to which he is expected to respond. . . This may have the side effects of changing a man's attitudes, his motivation—but these results are in fact side effects, not directly manipulable materials."

At the Training Research Forum Seminar, we asked Skinner to illustrate the difference between his position and those of the various human relations and motivation alchemists. Their problem, he responded, is that "they try to deal with things *in the person.* Our 'knowledge' of people keeps us from looking scientifically at the shaping factors which occurred in their past." Graphically, he sees behavior as the starting point for both himself and motivationalists.

But, they make the mistake of trying to infer from the behavior "what is going on inside" the person that "motivates" him to behave so. "These attempts to explain behavior by recourse to inner-man attributes are no explanation *until someone explains the explanation.*" Skinner has very little patience with the cognitive (or as he calls them, the "mentalism") group. To him, "the important objection to "mentalism" is that the world of the mind steals the show. Behavior is not recognizable as a subject in its own right." What's more, he says, "those who object most violently to the manipulation of behavior make the most vigorous efforts to manipulate minds."

'The Way I Did It'

The immediate problem which mentalism presents to the training man is that it seems to be widely shared by businessmen generally and by successful (top-level) managers especially. The successful executive likes to attribute his success to his own volition, hard work, perserverence, spirit, etc., and often assumes that people, being autonymous, are responsible for their own development—or lack of it. You really can't change behavior in any fundamental way, except that maybe you can "motivate" people to see the light (definition: "the way I did it.") by appealing to that inner-man potential we all are supposed to have. The consequence of this view for management's confidence in training is clear to us all.

Now the issue has spectacular visibility again because Skinner's critics have convincingly articulated the autonymous man concept and presumably reinforced that belief of our top management people. We need to recognize the intensity of that view and find a strategy for dealing with

it, or *we are not going to be given the chance to use behavioral technology* extensively as the basis for improving our reliability and effectiveness.

One response to the humanists/mentalists, on their own terms, has been made by Geary Rummler of Praxis Corporation. He points out that the so-called "humanists" have, in fact, less concern for the human than the behaviorist. Referring to Skinner's diagram of the causes of behavior, Rummler says that the behaviorist "proceeds on the assumption that the employee basically wants to do a good job, and given half a chance and reasonable support will probably do so."[12] (What's that? You didn't know that Skinner was the original theory Y man?) The trainer's task is to construct contingencies of reinforcement which can help him learn the job behavior and others which help him maintain it.

The humanist, on the other hand, sees a performance gap and "instantly jumps right on the *man*. "Let's find out what's *wrong with him*. Let's fix him up inside so that he has good values and attitudes." This seems to be not only a less optimistic view of man than the behaviorist approach, but it is what leads us to our irrelevant and ineffective attempts to "motivate" this troublesome person. The focus on the *consequences* of the person's behavior is more effective since the whole point of behavioral research is that *that* is what causes behavior. As Skinner says, "No one directly changes a mind . . . what we change in each case is a *probability of action*."

Or, as an anonymous psychologist put it, "How do I know what I think until I feel what I do?"[13]

We began with three questions, "How much of this is relevant to training? How much of it works? Under what conditions?

How Relevant?

Skinner's learning theory is relevant to training in direct proportion to your acceptance of our behaviorist definition of training. If you are comfortable with that approach, then this theory of reinforcement is not only relevant, it is probably the only way to carry it off.

How Much of It Works?

If you can accept the proposition that "Behavior is determined by its consequences," then any change in the consequences (and contingencies of reinforcement) of behavior "works" in the sense that it will change

behavior. How *well* it works depends on your skill in getting answers to the Skinner and the Feeney analysis questions.

Under What Conditions?

Aye, there's the rub.

The necessary conditions are not scientific or esoteric. They are about the same ones that make or break our present programs:

1. You have to know what you are doing. With reinforcement theory there's no "winging it." Only Dr. Fred can shoot from the hip without shooting himself in the foot. So, learn baby, learn!
2. You need access to the consequences of the present and the desired behavior—wherever they fall in the organization structure.
3. You will want to assure that your management people have some knowledge of what you are doing and your basis for it. Don't try to implement these concepts behind a smoke screen of pretending you're not. That means you will need to deal with the "inner-man motivation" beliefs which are so comfortable to top management.
4. Since the three preceding requirements are tough ones, the fourth is what the humanist will call "courage" and "tenacity," and what B.F. Skinner would call "arranging enough positive reinforcement for yourself to neutralize the aversive consequences of a lot of hard work and high risk."

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appendix b. table of behavioral paradigms

Table of Behavioral Paradigms

Name	Given	Procedure	Process	Result
Reflex adaptation	An elicitor, S_2	Repeatedly present S_2	R_2, the elicited response, declines in magnitude, increases in latency, etc.	Reflex strength is temporarily lowered
Pavlovian conditioning	Two elicitors, S_1 and S_2	Repeatedly pair S_1 with S_2	S_1 comes to control a new response (CR), which may resemble R_2	S_1 reliably evokes CR
Operant strengthening	1. An operant R at >0 frequency 2. A suitable reinforcer	R→S+	1. Increase in rate of R to new stable value 2. R becomes incorportated into a loop of behavior 3. The variability of R topography decreases	
Operant extinction	A previously strengthened R	R→	1. Decline in rate of R 2. Disintegration of loop of behavior 3. Increase in variability of form and magnitude of R	Behavior processes approach operant level states
Differentiation	A class of behavior at >0 strength	Reinforcement is applied to one set of variants within	1. Strengthening of reinforced variants	The reinforced variants are at high strength

		the class, the rest are submitted to extinction	2. Weakening of those variants undergoing extinction	
Discrimination	1. One response class 2. Two stimulus conditions	Reinforce the R in one of the stimulus conditions (S^D) and extinguish the R in the other stimulus conditions ($S\Delta$)	The response strengths in S^D and $S\Delta$ gradually draw apart, with a prolonged extinction process taking place in $S\Delta$	The organism comes to respond in S^D and not in $S\Delta$
L-set	Appropriate discrimination contingencies	Present a series of related discrimination problems	The individual discrimination processes gradually change from slow and gradual to sudden and abrupt	New, but related discriminations are solved with maximum efficiency
Satiation	1. Previously strengthened R 2. Organism deprived of a class of reinforcers	R→S +	Constant R rate followed by abrupt cessation of responding	The reinforcer has temporarily lost its reinforcing value
Escape conditioning	An aversive stimulus, S^-	Allow an R to terminate S^-	R increases in strength	S^- controls the occurrence of R
Frustration	A continuous reinforcement contingency	Abrupt extinction	Increase in reinforcing value of damage and destruction. Aggressive behavior increased in probability	

Source: J.R. Millenson, *Principles of Behavioral Analysis* (New York: Macmillan Co., 1967).

appendix c. an approach to a differential psychology of the adult potential*

A differential psychology of the adult years as a unique period in the life span of the individual has long been a period of relative neglect in the productions of the psychological enterprise. But within the last decade or more this situation has begun to improve. That improvement was underway by the late fifties and early sixties came to light in the writer's chapter on 'Psychology and Learning' in the June 1965 Review of Educational Research (14). Since then, additional and cumulative evidence is contained in the appearance of Birren's *Psychology of Aging* (2), Bromley's *Psychology of Human Aging* (5), Botwinick's *Cognitive Processes of Maturity and Old Age* (4), Hurlock's monumental *Developmental Psychology* (10), Neugarten's readings on *Middle Age and Aging* (17), and most recently Bischof's *Adult Psychology* (3).

Bischof is particularly impressive in submitting evidence for the momentum which the study of adult psychology is currently developing.

*McClusky, Howard Y. Reprinted by permission from *Adult Learning and Instruction*, edited by Stanley M. Grabowski (Syracuse: ERIC Clearinghouse on Adult Education, 1970), pp. 80-95.

Of the approximately 930 items contained in the 42 and a half pages of bibliography at the end of his book (p255-298), five percent were dated before 1950, nine percent appeared between 1950 and 1960, 20 percent between 1960 and 1965, *while 66 percent were published between 1965 and 1968.*

But for all this promising development there are as yet few deliberate and systematic attempts to formulate a position from which to develop a differential psychology of the adult years. The following presentation is submitted as a modest effort to move in this direction with particular emphasis on its relevance for an understanding of the adult potential.

To start promptly with our assignment it is proposed that a differential psychology of adults may be derived from an intermingling of selected aspects of the topics of (a) interaction, (b) dynamics, (c) personality change through time, and (d) differentiation. This presentation will deal primarily with the first three. More specifically it will include a variation on the S-O-R formula in developing the theme of interaction, a relatively new concept of MARGIN as an approach to the realm of dynamics, and finally it will draw on developmental and life cycle theory in discussing changes in adult psychology through time.

Learning and the S-O-R Formula

To learn is to change and the scheme most commonly proposed for explaining how learning-change takes place is the **S** (stimulus), **R** (response) formula or some variation thereof.

Historically, the **S-R** formula is essentially a more recent version of antecedent association or connectionist theories of learning. According to this view, learning occurs if we can associate or connect a new stimulus to an earlier response, or a new response to a former stimulus. In either case some change occurs. This focus on relatively objective stimulus-response units of behavior has provided the conceptual framework for bringing the processes of learning out into the open where they could be measured and presumably predicted and controlled. The presumption of the original **S-R** model was that if we could account for and measure the stimulus, like the impact of a cue on a billiard ball, we could predict the magnitude and direction of the response. Or if we knew enough about the response, we could retroactively reconstruct the characteristics of the stimulus which was originally responsible for its arousal.

The **S-R** scheme works fairly well as long as learning is confined to simple kinds of learning. But it encounters severe difficulties when learning is more complex and the learner is more mature. Consequently, it is a much better explanation of the quasi-mechanical learning of early childhood than it is of the more complex learning of the adult years. The difficulty lies chiefly in the fact that the raw physical properties of the stimuli are not sufficient to account for individual differences in response. Something more, called the 'intervening variable' is required. In terms of our formula the intervening variable is the person—**O**—the one stimulated and the one responding.

At this juncture it is necessary to draw on what we know about perception, for it is the role of perception which constitutes the empirical and theoretical basis for elevating the importance of the **O** in our formula and thereby stressing the unique importance of the adult condition as a decisive factor in adult behavior.

We return to the point that it requires more than the raw physical properties of the stimulus to account for the individual's response—**R**.We begin with the the reality that a person is immersed in an environment of incessant stimulation bombarding in varying degrees the sensory receptors (i.e., eyes, ears, nose, etc.). If unregulated, this all-pervasive bombardment could overwhelm and immobilizee the individual. Fortunately some of this stimulation is blocked out, while some filters through. Insight into the filtering process may be derived from an awareness of the facts and theory of perception.

In the first place, perception is highly selective. That part of stimulation which finally becomes a part of experience is NOT a random sample of what is totally available. There is (a) selective exposure and within the exposure field, (b) selective awareness. That is we do not see, hear, etc. everything and we are not equally aware of everything we see, hear, etc.

In the second place, perception tends to be organized. A person perceives things in patterns that are meaningful to him. For example, note the influence of context (e.g., the Müller-Lyer illusion), figure and ground, grouping and closure. Gestalt psychology has been especially influential in calling attention to the crucial role of perceptual organization.

In the third place, both selection and organization as well as the interpretation of what is perceived, are clearly influenced by the needs, disposition and set which a person brings to the perceptual experience. Experiments indicate that people are more likely to see an ambiguous picture as containing food objects when they are hungry than when they are satiated. Other research reveals that college students interpret a

picture anxiously when hypnotized in an anxious mood, critically in a critical mood, and positively in a positive mood. And in a classic experiment Bruner and Postman demonstrated that in the case of ten-year-old boys the perception of the size of coins was directly related not to the size but the *value* (to the boys) of the coin.

Thus not the raw physical property of the stimulus but the individual's PERCEPTION of the stimulus is the key factor in determining the response. We cannot then predict—**R**— the response exclusively from our knowledge of the—**S**—stimulus. HENCE, I KNOW WHAT I SAY BUT I DO NOT KNOW WHAT YOU HEAR; I MAY KNOW WHAT I SHOW BUT I DO NOT KNOW WHAT YOU SEE.

The mistake of the original **S-R** formula has been its reductionist over-simplification of the highly complex nature of the learning process. By overemphasizing both stimulus and response as well as their external character, it has reduced if not ignored the unique importance of the person (the intervening variable, **O**) as the agent receiving and often originating the stimulus as well as the one giving the response. A more valid version requires the insertion of an **O** between the **S** and the **R**, thus reinstating the learner as an indispensible factor in understanding and influencing the learning process. The neglect of the person—**O**—as learner explains why telling—**S**—is not necessarily teaching and why listening—**R**—is not necessarily learning. Both Input—**S**—and Outcome—**R**—must be anchored in the person who is supposed to do the learning. This point is especially relevant in the adult years when experience becomes more and more cumulative and behavior increasingly differentiated.

Learning involves not only elaborate exchanges between stimuli, responses and the learner, but it must be equally dynamic if it is to be effective. As one approach to understanding the dynamics of adult learning, let us turn to an examination of the concept of Margin.

Margin is a function of the relationship of Load to Power. In simplest terms Margin is surplus Power. It is the Power available to a person over and beyond that required to handle his Load.

> By Load we mean the demands made on a person by self and society. By Power we mean the resources, i.e. abilities, possessions, position, allies, etc., which a person can command in coping with Load. Margin may be increased by reducing Load or increasing Power, or it may be decreased by increasing Load and/or reducing Power. We can control both by modifying either Power or Load. When Load continually matches or exceeds Power and if both are fixed

and/or out of control, or irreversible, the situation becomes highly vulnerable and susceptible to breakdown. If, however, Load and Power can be controlled, and better yet, if a person is able to lay hold of a reserve (Margin) of Power, he is better equipped to meet unforeseen emergencies, is better positioned to take risks, can engage in exploratory, creative activities, is more likely to learn, etc., i.e. do those things that enable him to live above a plateau of mere self subsistence.

There is a rough similarity between the ideas of Load and Power and other concepts. For example, Stress may from one viewpoint be considered or regarded as a kind of Load. Load is also quite similar to the idea of Input in communications theory. That is Input is a Load delivered to a system of transmission. If Input is too ambiguous or if its volume and rate become excessive, a condition of 'overload' arises, resistance sets in, and breakdown may occur.

The idea of Power also has its analogues. For example, Resilience may be regarded as a kind of latent Power. It is the capacity for recovery after expenditure, depletion or exhaustion. Again, Margin is related to the notion of capital in economics. Here, net profit may be considered as a surplus for distribution or reinvestment for expansion, or increased productivity. Also in engineering the factor of safety is a direct application of the idea of Margin. In this case, after estimating the greatest stress to which a building, bridge, airplane, machine, etc. may be subjected, additional units of strength are built into the construction as an assurance that liberal Margins of safety will be available to the client.

But the key to the meaning of Margin lies not only in the subconcepts of Load and Power but even more in the relationship between them. For example, the amount of Power a person possesses will obviously have a strong bearing on the level and range of his performance. But the strategic factor for a person's selfhood is the surplus revealed by the Load Power ratio which he can apply to the achievement of a preferential development (15).[1]

In the light of our theory therefore, a necessary condition for learning is access to and/or the activation of a Margin of Power that may be available for application to the processes which the learning situation requires.

In the preceding discussion of the **S-R** formula and the theory of Margin, it will be noted that except for a few instances the reader has been

[1]The above quotation is taken with permission from the writer's article listed as item 15 in the bibliography.

left largely on his own to relate these concepts explicitly to the psychology of adults as a special field of inquiry. That they are relatable is quite clear. In the processes of behavioral development the elements of **S, O** and **R** become woven together in complex patterns of acquisitions and as the years advance, as indicated above, the **O** becomes increasingly a uniquely dominant factor in the transactions involved. Likewise in the realm of Margin, the adjustments of Load to Power become matters of overeaching concern as a person accumulates and later relinquishes adult responsibilities and modifies the varying roles which the successive stages of the life cycle require. But a full recital of the relevance of **S-O-R** and Margin requires more attention than this occasion permits.

If we are looking for a subject matter especially germane for adult psychology, we will find it more specifically revealed in the characteristics of changes in the adult years. Added to the concepts of **S-O-R** and Margin data in this field provide a substantial body of cognitive material from which to fashion a differential psychology of adulthood.

Change in the Adult Years

Critical Periods

One way to view change in adulthood is to conceive of the 50 plus years following childhood and youth as a procession of critical periods. These may originate in or be terminated by some significant event, but the time prior to, following, or in between events calls for the word 'period' as a more functional designation of the idea we wish to convey. These periods are characteristically productive of experiences decisively important to the persons involved during which marked changes in social role and meaningful relationships may occur. Entry into, advance in, transfer from, or loss of employment would represent one category of such events. Marriage, the birth of a child, or the loss of marriage partner, children, parents, relatives, and other significant associates illustrates another category. The sensitive periods of readjustment leading up to and following these and similiar events often give rise to strategic 'choice points' in life direction and often compel adults to make and 'agonizing reappraisal' of their circumstances and the prospect confronting them in the years ahead. It is in such periods that some of the most meaningful learning may occur, when an older dog may learn some tricks better than younger dogs who have yet to be confronted with some of the critical events of life.

Commitment

In the idea of *commitment* we have another useful way of looking at the changes confronting a person with the passage of the adult years. Our definition of commitment consists of two components: one is an 'intentional attachment' and the other a responsibility unique to adulthood as its object. In general, change would be viewed as incremental and cumulative as well as having varying degrees of intensity and range of involvement.

To illustrate in the family domain, commitment in courtship would be regarded as tentative. Marriage itself would be regarded as the beginning of a major continuing commitment in turn leading to an accumulation of obligations with the coming of children and the widening of the kinship circle. In the occupational field, it would presumably be attached first to the job itself, then to co-workers, the employing institution, and the consumers of the job's services. Similarly, as the years unfold, commitments could be extended to the church, political party, civic associations, special interest groups, the community, and the like, in varying combinations and degrees of priority.

In such a progression commitment could be evaluated typically as follows: in childhood it would be nonexistent or embryonic; in youth, diffuse and provisional; in early adult life, with the arrival of basic job and family obligations, it would become more authentic and binding but still limited in scope; while in the middle and late middle years it would embrace the largest number and variety of concerns including attachments to work, property, civic affairs, and especially the extended family when an obligation to one's aging parents on the one hand begin to compete with one's obligation to one's growing, but still partially dependent children on the other. In later years a shift and reduction in commitments would appear with a selective disengagement in some areas and a deepening of attachment in others.

The preceding sketch constitutes only the bare bones of an approach for mapping the progression of life commitments, but it suggest that in this concept we are not considering a vague, intangible entity, but one which, with appropriate methodological ingenuity, could be counted, scaled, and charted with a degree of operational reliability and validity. But even without measurement we have here an idea with much utility for understanding some of the stubborn aspects of adult learning. For example, it helps explain the binding and 'locked in' character of so much of adult life which may add to the problem of resistance to learning. More specifically it suggests that resistance to learning

may not necessarily reflect a reluctance on the part of the adult to learn but simply his unwillingness to dislocate some of the basic commitments around which much of his life is organized. Such an adult would be much more likely to learn if his basic commitments could be eased (e.g., via leaves of absence with pay and allowance for family expenses) so he could be more free to learn.

Time Perception

In the perception of time, we have another fruitful way of looking at the progression of the adult years. It makes a great deal of difference in one's orientation to learning whether life lies ahead as it does at age 21, is about midway as at 40, and is largely in the past in memory or ahead in one's children as at 70. To be behind, on, or ahead of schedule with respect to life expectations, or more important to be aware that one is behind, on, or ahead of schedule, may have a profound effect on life adjustment and consequently one's willingness to undergo a program of systematic instruction.

There is much evidence to show that at about 30 the young adult begins to realize that time is not unlimited and that as time passes his range of options with respect to job, family and other areas of living are becoming correspondingly reduced. A little later he begins to stop measuring his life from the date of birth but instead from the years remaining before death. His thoughts become relatively less concerned with the world of outer activity, and somewhat more absorbed in the inner world of contemplation.

A related feature of time perception is the common experience that time seems to pass more rapidly as one grows older. There may be a partial explanation in the following 'arithmetic of time:' at 16, one year is one 16th of the time a person has lived, at 40 one year is a 40th, and at 70 a 70th of the time lived. Thus with advancing years, a unit of time, e.g., one year, becomes a decreasing fraction of the time experienced and is so perceived. This fact added to the decrease in perception of life expectancy undoubtedly has a profound and pervasive impact on the attitudes of adults as the years unfold—an impact which in turn also affects an adult's perception of his potential as a learner. An unpublished study of the writer's indicates that up to about age 50, middle class adults do not seriously question their ability to take part in activities requiring new learning, but with other factors constant, after 50, doubts about the capacity to learn begin to appear. In the light of our argument, one explanation may be that as one passes beyond age 50 the perception that time is running out may make a great difference in an adult's attitude toward the appropriateness if not legitimacy of resuming a life of systematic inquiry (16)[2].

[2]The above quotation is taken with permission from the writer's article listed as item 16 in the bibliography.

'Critical Periods,' 'Commitment,' and 'Time Perception' are relatively new topics in the literature of adult psychology. More familiar however are the formulations which have come from the field of developmental psychology. In continuing our discussion of 'Change in the Adult Years,' six of these have been brought together in the following Table: 'Comparative Designations of Developmental Stages.'

The items in Table C-1 may be roughly grouped into two categories. One appears under the heading: Biological, Kuhlen and Buhler; the other under the rubrics of: Eriksen, Peck and HYMC. The items in the first category are similar in suggesting an initial stage of consolidation (Stability of Growth, Maintenance, and Culmination) and a final stage of decline (Regressive Growth, Defense Against Loss, and Decline).

In comparison, the second category embodies a somewhat different and more optimistic stance. For example, Peck moves from the issue of Valuing Wisdom vs Valuing Physical Powers in early adulthood to Ego Transcendence in the later years and similarly Eriksen moves from the achievement of a Sense of Intimacy to the achievement of a Sense of Ego Integrity, with no sugggestion in either case that the direction of change which they imply represents a decline in the adult condition. At the same time this writer (McClusky) holds that by realigning and transvaluing the relationships of Load to Power, the later years may in fact be a period of progressive growth.

The emphasis of the second category of items suggests that there may be a potential for the prolongation of adult development not acknowledged by the conventional view of change in the adult years. We will return to this point in the following section.

Changes in Intelligence (The Ability to Learn) with Age

In general, there have been two kinds of data employed to deal with this issue, one is cross sectional and the other longitudinal in character. The cross sectional kind studies a random number of persons in different groups at successive age levels, while the other studies the same persons over various intervals of time. The first of the cross sectional type was reported by Thorndike in his classic volume on *Adult Learning* (22).

He studied the rate of learning over time, and from his data derived his famous age curve of learning ability with a peak at 22 and a decline of about one percent a year to age 50. A somewhat later investigation by Jones and Conrad of about 1,200 persons ranging from 10 to 60 years of age in several New England villages yielded similar results. They showed a

Table C-1
Comparative Designations of Developmental Stages—Mostly Post Adolescent Through the Life Span

Biological	Kuhlen (12)	Buhler (3)	Eriksen (9)	Peck (20)	HYMC (15)
Progressive Growth (0-25)	Expansion	Preparatory (0-25)	Intimacy vs Isolation		Development of Margin
Stability of Growth (25-45)	Maintenance	Culmination Largest No. Dimensions (25-50)	Generativity vs Stagnation	Valuing Wisdom vs Physical Powers	Expansion of Margin
				Socializing vs Sexualizing	
				Cathectic Flexibility vs Impoverishment	
Regressive Growth (45 plus)	Defense Against Loss	Decline (50 plus)	Ego Integrity vs Despair	Mental Flexibility vs Rigidity	Transvaluation of Margin
				Ego Differentiation vs Work Role Pre-Occupation	
				Body Transcendence vs Body Preoccupation	
				Ego Transcendence vs Ego Preoccupation	

steady rise in intelligence from 10 to 21 followed by a decline in each of the subsequent age groups (11).

Yet again and later, Wechsler in his standardization of the Bellevue Intelligence scale in 1935 showed a high point in performance for his subjects at 22, followed by a gradual decline. Wechsler's data are particularly pertinent since they were derived from the use of an instrument especially designed to measure adult intelligence. Thus from the cross sectional studies we get a picture of intelligence peaking in the early twenties with performance gradually diminishing thereafter.

But the longitudinal studies, most of which have been conducted since those cited above, have revealed a somewhat different and more optimistic situation. Beginning with studies at mid-adulthood of change in learning ability with age, it is interesting to note the outcome of a follow-up of the famous investigation of gifted children conducted by Terman and Oden—and on another, Oden and Bayley (1) were able to locate and retest a number of the original sample who by the time of the later inquiry were in the middle years of adulthood. In general, the results of both investigations revealed a gain in each of four age groups on tests constituting measures of conceptual thinking (21).

Turning to a study embracing an even wider interval of time, Owens has reported data particularly relevant for our problem. In 1950 when his subjects were about 50, he retested a group of college graduates who had originally taken the same test (Army Alpha) as freshmen at Iowa State College. About 11 years later, when his subjects were 61, he administered the same test a second time. Thus there were two follow-up administrations of the same test to the same persons—the first after an interval of about 32 years and the second after an additional interval of about 11 years. At 50, the subjects showed a slight gain over their performance as freshmen and at 61, they maintained the level they had attained in general at 50 with a decline only in tests of numerical ability (18, 19).

Support for the Owens picture of the mental ability of adults over 50 is reported by Eisdorfer, who after a three-year interval found little change in the performance of 165 adults on the full scale WAIS (8), and by Duncan and Barrett whose research yielded similar outcomes with 28 men after a ten-year interval (7).

What is the meaning of this apparent discrepancy in the results of cross sectional and longitudinal types of studies?

In attempting to answer this question, Lorge—a student of Thorndike—made a distinction between speed or rate of response on the

one hand and power of response on the other. He noted that as persons move through the adult years there is a decline in the speed of their reaction. But he also pointed out that this did not necessarily signify a parallel decline in the power to react. By using tests of power under timed and untimed conditions, he conducted a series of investigations that tended to confirm his theory (13).

Others have objected to the results of the cross sectional studies on the ground that tests of intelligence and learning are biased in favor of youth. Young people have usually had more experience in taking tests than older persons and their contact with the material in the test items is more recent and hence more available.

Finally, perhaps the most serious objection relates to the criterion problem. What is a good criterion with which to correlate measures of adult intelligence? Is it academic achievement, a dimension often used in the validation of intelligence tests? Probably not, but if effective performance in coping with the stresses and requirements of the adult years is a criterion and if this could be measured, we might come out with a different view of the structure and growth of adult intelligence. The criterion problem is one of the most difficult to resolve in the entire arena of psychological inquiry. It permits no easy answer, but it raises issues so fundamental that when related to the measurement of adult intelligence, the problem of either its decline or increase must be viewed in a different perspective.

But to this writer the most significant point to be derived from cross sectional investigations stems from two kinds of related data. One is the diminishing scores of successively older groups of adults and the other is that in the 1955 standardization of his scale of adult intelligence, Wechsler reports a five-year advance in peak ability (23).

To elaborate: in the case of the first point, it is well known that older persons have had lesser amounts of formal education than younger persons and that amounts of formal education gradually decline as the age of the study population increase. It appears therefore that the peaking of ability in the early twenties revealed by cross sectional investigations and gradual decline thereafter is just as likely to reflect a decline in amounts of formal education achieved by adults as it does a decline in adult ability to learn.

The five-year increase in peak ability reported by Wechsler would tend to support the same point. Because in the 16-year period between 1939 and 1955, the educational level of the general population increased substantially and at the same time advances in availability and usage of the

mass media, i.e., radio, TV, and the printed page were equally substantial. Thus the general environment became more stimulating and educative. This interpretation of the outcomes of cross sectional investigations combined with the results of longitudinal studies showing no decline, give further support to the viewpoint expressed at the conclusion of the preceding section: (1) that the conventionaal view that changes in the adult years inevitably bring about a decline in intelligence (or the ability to learn) can now be challenged by a growing body of respectable empirical data; and (2) the three-phase model of growth, consolidation, and decline as descriptive of the adult potential must be thoroughly overhauled and restated with a more optimistic stance.

But there are other grounds for believing that the adult potential has been underestimated.

Role and Self Concept Theory

In the prevailing view of society, it is the major task of children and youth to go to school, study, and learn and the major task of the adult to get a job and work. In brief, childhood and youth are time for learning and adulthood a time for working. This is beginning to change, but the dominant thrust of society's expectation and equally of his self expectations is that for an adult the learning role is not a major element in his repertoire of living. Thus both society and the adult view himself as a non-learner. Our theory is that this failure to internalize the learner role as a central feature of the self is a substantial restraint in the adult's realization of his learning potential. Or more positively stated, if and when an adult thinks that studying, learning, and the intellectual adventure is as much a part of life as his occupation and obligation to his family, he will be much more likely to achieve a higher level of intellectual performance. Briefly, it is proposed that the potential is there but it needs self and societal support to bring the potential to fruition.

Sense of Discovery

Similarly it may be argued that another disposition, namely a sense of discovery, tends to be lost in the adult years and if recovered, retained, and cultivated would contribute greatly to intellectual performance.

A brief examination of what happens with the passing years will lend plausibility to this hypothesis.

We are on safe grounds for holding that about 15 months of age, when a child's ego is beginning to take shape, most of an individual's waking hours are devoted to discovering the exciting world about him. Everything is new and everything literally from the ground up must be learned. There are unending mysteries to unravel, new tasks to be mastered, and new frontiers to be explored. But as the strange becomes more familiar, and as skills become habitual, the sense of discovery begins to recede.

This becomes increasingly true as one approaches adulthood and as the skills and activities required for the major responsibilities of living are mastered. Here discovery gradually gives way to repetition, and acquistions to maintenance. There is nothing essentially reprehensible about this. In fact a certain amount of habituation is necessary, and in most enterprises effective maintenance is as essential as the original process of building.

It certainly would not be efficient for example, if we as adults had to devote as much time and attention to learning to tie our shoes, learning to read and write, or even drive a car as children and youth must learn to do. The world of dressing up, of becoming literate, etc. must become as efficient and habitual as possible in order that these skills may be instruments for better things. So a naive belief in the wonders of discovery could easily lead us into a primitive kind of romanticism utterly unrealistic for the exigencies of adult living.

But typically, for most adults the efficient performance of maintenance activities does not release a person to continue the adventure of discovery. Instead, following the Law of Least Effort, he tends to take the convenient road of repetition, gets into a rut and appears gradually to reduce his ability to cope with the intellectual demands of his world. But there is nothing inevitable in the order of things that this should occur. It is the intent of our theory that the loss of the sense of discovery is a reflection of a condition in which an adult allows the requirements for maintenance to override his needs for the pursuit of inquiry, and not a reflection of an absolute decline in ability. More positively, it is also the intent of our theory that a sense of frontiersmanship can be cultivated and restored, that the adventure and wonder of life can be renewed, if not increased. If to his self expectation as a continuing learner, an adult could add a picture of himself as one continuing to discover, he could heighten his ability to learn and inquire, for here the Law of Use would overcome the Law of Disuse, and the thrust of his inquiry would be reinforced by the cumulative satisfactions resulting from his constant probe of the edge of the unknown. What better validation of the preceding hypothesis could there be than the

common experience that as one advances in years, and learns more and more about the world about him, the more he realizes how little he really knows and that a vast terrain of the yet-to-be-discovered remains to be explored.

In conclusion, we have attempted to build a case for a differential psychology of the adult years, and in so doing have also proposed a post hoc interpretive hypothesis that the trend of both empirical and theoretical evidence is supportive of the view that adults have a potential for continuing learning and inquiry which historic conventional wisdom has failed to recognize. Ours then is a stance of unrealized potential and not one of *de facto* limitation. It will be interesting to note in years ahead which of these two views the thinking and research of the future will tend to confirm.

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    In many cases, satisfaction of needs or goals results in lack of motivation to seek something similar but more challenging, and the realization that a goal or desire is unattainable results in giving up a desire for it. Status of age, pressures of time and money, physical change and decline, skill deficits, and "locked in" feelings influence motivation by causing one to adapt his goals to those more within his reach. Needs of growth-expansion are less important in later life as feeling of anxiety and threat increase. Later ages have a reduction in ego-involvement with life; an increase in disengagement, in anxiety, and in negative self concepts; and a decrease in happiness. Economic and social class attitudes play roles in determining perception of aging. There is some evidence that old age adjustment depends largely on a person's own self assessment of whether or not he reached fulfillment in his own life.

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The writer argues that the person, as a potential or actual participant is the point of initiation in and entry into community activites and his motivation is the key to the continuation and improvement of participation in community development.

16. McClusky, H.Y."The Adult as Learner', in the *Management of Urban Crisis*. McNeill and Seashore, editors. New York. The Free Press. 1971. In press.

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Most of the selections (58) in this anthology discuss the problem of what social and psychological adaptations are required as individuals pass through later life. Major attention is paid to the importance of age status and age-sex roles; psychological changes in the life cycle; social psychological theories of aging; attitudes toward health; changing family roles; work, retirement, and leisure; dimensions of the immediate social environment as friendships, neighboring patterns, and living arrangements; difference in cultural settings; and perspectives of time and death. Empirical studies, and those in which research methods are clearly described, are presented wherever possible, together with theoretical and summary papers and a few investigations that present innovative methods and concepts. Various research methods are illustrated: questionnaires, surveys, interviews, projective tests, participant observation. The four appendixes in particular pose methodological problems in studying longitudinal change. Tables, figures, and an extensive bibliography also appear.

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appendix d. toward a model of lifelong education*

Alfred North Whitehead presented the insight about two generations ago that the reversal of the relationship between two basic dynamics of civilization in this century has required the redefinition of the purpose of education. Throughout history, until the first quarter of the 20th century, the time-span of major cultural change was greater than the life-span of an individual. Under this condition it was appropriate to define education as a process of transmittal of what is known—of transmitting the culture. It was also appropriate to define the role of the teacher as that of transmitter of information and to regard education as an agency for youth.

But, Whitehead pointed out in a commencement address at Harvard University in 1930, "We are living in the first period of human history for

*Knowles, Malcolm S. A working paper prepared for the Consultation on the Concept of Lifelong Education and Its Implications for School Curriculum, UNESCO Institute for Education, Hamburg, October 9-12, 1972.

which this assumption is false . . . today this time-span is considerably shorter than that of human life, and accordingly our training must prepare individuals to face a novelty of conditions."[1] In other words, as the time-span of major cultural change has become shorter than the life-span of the individual, it becomes necessary to redefine education as a process of continuing inquiry. The role of the teacher must shift from that of transmitter of information to facilitator and resource to self-directed inquiry, and to regard education as a lifelong process. For knowledge gained at any point of time will become increasingly obsolete in the course of time.

Two generations after this insight was presented, the schools around the world largely remain tied to the subject-matter transmittal framework of the medieval trivium and quadrivium (with some elaboration and the addition of vocational subjects). Accordingly, the educational establishment has come under increasing criticism from such social analysts as Saul Alinsky, Philippe Aries, Jerome Brunner, Jerry Farber, Paulo Freire, Paul Goodman, John Holt, Torsten Husen, Sidney Jourard, Ivan Illich, Rene Maheu, Margaret Mead, Jean Piaget, Neil Postman, Everett Reimer, Carl Rogers, Charles Silberman, Harold Taylor, and Alvin Toffler. The heart of much of the criticism is that the schools are out of touch with the reality of both human nature and the nature of a changing world. And one of the crucial new realities is that education must be lifelong to avoid the catastrophe of human obsolescence.

Clearly, therefore, new models of education as a lifelong process must be developed. I present the skeleton of such a model below in the hope that others will join me in strengthening it and putting flesh on it. The model consists of several assumptions and elements.

Competency Development for Life Roles

The first assumption is that the purpose of education is the development of competencies for performing the various roles required in human life. The first element in a new model would, therefore, be a taxonomy of these roles and their required competencies. The beginning of such a taxonomy is shown in Table D 1.

[1]Alfred N. Whitehead, "Introduction," Wallace B. Donham, *Business Adrift* (New York: McGraw-Hill Book Co., 1931), pp. viii-xix.

Table D-1
Competency Development for Life Roles

Roles	Competencies
Learner	Reading, writing, computing, perceiving, conceptualizing, evaluating, imagining, inquiring
Being a self (with unique self-identity)	Self-analyzing, sensing, goal-building, objectivising, value-clarifying, expressing
Friend	Loving, empathizing, listening, collaboraring, sharing, helping, giving feedback, supporting
Citizen	Caring, participating, leading, decision-making, acting, "con-scientizing," discussing, having perspective (historical and cultural)
Family member	Maintaining health, planning, managing, helping, sharing, buying, saving, loving, taking responsibility
Worker	Career planning, technical skills, using supervision, giving super-vision, getting along with people, cooperating, planning, delegating, managing
Leisure-time user	Knowing resources, appreciating the arts and humanities, performing, playing, relaxing, reflecting, plan-ing, risking

Obviously this list is not exhaustive; it is intended merely to illustrate some kinds of potential candidates for a taxonomic system.

Development of Skills of Learning

The second assumption is that the primary purpose of schooling is to help children and youth learn the skills of learning. The ultimate behavioral objective of schooling would be: "The individual engages efficiently in collaborative self-directed inquiry in self-actualizing directions." I believe that these skills of learning include at least the following:

1. The ability to develop and be in touch with curiosities. Perhaps another way of describing this skill would be "the ability to engage in divergent thinking."
2. The ability to formulate questions, based on one's curiosities, that are answerable through inquiry (in contrast to questions that are answerable by authority or faith). This skill is the beginning of the ability to engage in convergent thinking or inductive-deductive reasoning.
3. The ability to identify the data required to answer the various kinds of questions.
4. The ability to locate the most relevant and reliable sources of the required data (including experts, teachers, colleagues, one's own experience, the various audio-visual media, and the community).
5. The ability to select and use the most efficient means for collecting the required data from the appropriate sources.
6. The ability to organize, analyze, and evaluate the data so as to get valid answers to questions.
7. The ability to generalize, apply, and communicate the answers to the questions raised.

The Development of a Spiral of "Learning Projects"

The third assumption is that the curriculum of organized education will most effectively achieve the objective of schooling if it is organized according to a spiraling series of individual learning projects,[2] with the un-

[2]For an eleboration on the concept of learning projects, see Allen Tough, *The Adult's Learning Projects* (Toronto: The Ontario Institute for Studies in Education, 1971), pp. 6-15.

derstanding that several individuals with similar learning needs might engage in a learning project collaboratively. Under this assumption I visualize that the school would be presented to learners as a *learning resource center* and that teachers would be presented as *learning project consultants*.

In brief, the curricular process would work something like this:

Each individual's learning project spiral would proceed according to his maturational process.[3]

At each developmental stage (to be determined by diagnostic procedures) the learning project consultant would expose the learner to appropriate role competency models. For example, for early learner, friend, family member, and leisure-time user. These roles might well be the focus for the next several years, with increasingly complex competencies being presented. In early adolescence the emphasis would gradually shift to the roles of unique self, citizen, and worker.

Following each exposure to a role competency model the learner would select a set of competencies for which learning projects would then be developed with the help of learning project consultants and other relevant resource specialists. Emphasis would be placed on the learner's making use of learning resources increasingly proactively and in widening circles out into the community.

At the completion of each learning project the consultant would engage with the learner in an analysis of the experience in a variety of dimensions, including cognitive gains, learning skill gains, affective gains (and losses), and diagnosis of further needs.

I visualize that the learner would be gradually weaned away from the perception that he is engaged in schooling, and that when he has acquired the skills of learning appropriate to his aspirations he will come to see himself as a self-directed learner, making use of the learning resources center as a resource that is available to him on his terms for the rest of his life. There will be no such thing as graduation. There will be no such things as adult education. There will only be lifelong education.

[3]For fuller treatment of my concept of "Dimensions of Maturation," see Malcolm S. Knowles, *The Modern Practice of Adult Education: Andragogy versus Pedagogy* (New York: Association Press, 1970), pp. 25-29.

appendix e. the role of training in organization development*

Training of individuals to perform their jobs more effectively seldom has positive impact on the organization. The type of training I have in mind is in the area of behavioral or attitudinal change, not manual skill development. The training I am discussing does include, however, managerial skill development, like learning to communicate more effectively interpersonally. In this paper, I argue that individual training programs which are not integrated within the context of an overall organization improvement effort will have little if any positive impact on the organization.

A Strategy of Change

Training, as the term is employed by most organizations, is generally an *individually oriented* educational strategy which assumes that individual change is the primary mediator of organization change. This leads to the

*Burke, W. Warner. *Training and Development Journal*. Vol. 26, No. 9 (September, 1972), p. 30-34. By permission.

belief that if the person can be changed, for example, made more democratic in his managerial practices, the organization will, as a consequence, operate more effectively.

Approaches to organizational change differ as a function of their underlying themes and strategies. For example, one approach to organizational change involves some modification in the design of the organizational structure—like to move from a centralized form of management to a decentralized one. Another approach is to alter the technological system, for example, to automate some aspects of production, or to modify the environmental system by redecorating a group's work area.

In each of these cases the change agent has an underlying assumption that individual behavior will change as a direct function of the modifications and, consequently, that the overall organization will be changed such that the results will be higher production and morale. This assumption of individual change has validity, but such changes may also result in negative attitudes on the part of the person affected, particularly if a structural change is imposed without his consent or consideration.

Individual Strategies Ineffective

As Hornstein, Bunker, and Hornstein[2] have succinctly pointed out, individually oriented strategies of change, such as training, are not effective in producing organizational change. This is due to at least three basic problems. The first relates to an age-old issue in training—transfer of learning. The simple fact that most training occurs in a location other than the individual's work space produces the problem of re-creating the training milieu and learning back on the job.

Critical mass is a second problem. How many people must one train to obtain the desired impact on the organization? In a large organization, the answer to this question is difficult to formulate.

A third problem relates to the social psychological principle, identified in Lewin's classic work,[3] that individual behavior in a group context is considerably shaped and regulated by social norms. Individual training often requires individual deviance from accepted norms, e.g., the individual is trained to be more "open" in his interpersonal communication when the norm of his organization is to be diplomatic and to "play things close to the vest" in interpersonal relationships. Since conformity to social "regulators" is a powerful determinant of human behavior, organization members are more likely to conform to patterns of expected behavior than

to violate such norms by applying what they learn in a training environment.

Given these problems with training, why do many trainers still rely on individual approaches to organizational change? One reason may be that trainers know skill training (training people to meet immediate needs of production) does have immediate and observable impact on the organization, and therefore implicitly believe that training in behavioral or attitudinal change should have the same degree of observable success even though other dynamics—group norms—are more directly involved.

Influence Lacking

Another reason may be that trainers do not have enough power and influence in the organization to produce an effective process of organization change, so they rely on the one strategy they can command, i.e., training individuals. Of course, as I have implied, still another reason for trainers continuing to rely on an individual strategy is that they do not understand that groups are easier to change than individuals.[4]

If the target for change is a person, there is some evidence that training makes a positive difference. Campbell and Dunnette[5] have shown, for example, that sensitivity training changes individual behavior. They also point out, however, that it has not been demonstrated that changes in individual behavior result in systematic organizational change. The findings of Campbell and Dunnette are corroborated by a number of similar articles.[6] Thus, if the target for change is the organization, then individually oriented training is clearly an inappropriate strategy.

OD More Effective

Organization development (OD) is a more effective strategy for the trainer (a more appropriate term might be consultant or OD specialist) to employ if his target for change is the organization or some significant part of it. As I have discussed previously,[7] OD as contrasted to training is reported in the literature[8] as an effective means for improving organizational performance, including both morale and productivity.

Organizational development is a process for developing an organization climate based on social science principles for diagnosing and coping with inadequacies in interpersonal, group and intergroup behavior in the organization's culture (normative system, structure, work-flow patterns, etc.). The process leads to behavior changes in formal decision making,

communication, planning, problem solving, and the exercise of authority and responsibility. OD focuses also on improving and reinforcing existing strengths of the organization.

In addition, as Adams and I have indicated,[9] OD represents a value statement. For example, values held by many OD practitioners stress participation of all relevant persons during the various phases of an OD effort. Individual respect and dignity are emphasized as well. Typically, the OD practitioner sees to it that his personal values are made explicit and public.

With respect to approach, OD follows a two-phase process of diagnosis, *then* intervention. In other words, information about the organization's climate and culture is gathered as a foundation for diagnosis, and then on the basis of this diagnostic data, a plan is developed for organizational improvement.

Low Congruence Shown

Training is frequently criticized, for example, because programs are planned and conducted on the basis of conscience or convention rather than real organizational need. For example, a friend of mine, who is responsible for training managers in a very large organization, recently conducted research which substantiates this criticism. Specifically, he collected data from one item on managers' appraisal forms—what training does the manager say he needs? My friend compared the answers to this question with the kind of training the managers had actually received. He found that the congruence was no greater than 15 percent. I was pleased to learn from him that he is now working to increase this congruence, and he is utilizing OD principles and practices to help him do it.

Organization Development as a strategy for change focuses on examining and often changing social norms and values as a primary mediator of organizational change.[10] The technology of OD has been described in a variety of articles and books,[11] and I will not try to repeat these descriptions here. For the purposes of this paper, it is primarily important to understand that OD encompasses a variety of change methods, most of which are based on the applications of behavioral science knowledge and techniques. Briefly, the social technology of OD involves first, diagnosis, and second, a planned intervention which is based on this diagnosis.[12] The OD specialist may employ a variety of interventions to respond to the diagnosed needs for change. Typical interventions are (a) team building,[13] (b) survey feedback,[14] (c) the management of conflict,[15] (d) technostructural changes,[16] and (e) training, but not training in the traditional sense.

As a part of an OD strategy, training can be used as a method for organizational change and improvement *provided* it is planned and conducted as a result of some diagnosed need for it and is based on sound educational principles. In other words, I conceptualize training, particularly training for managers,[17] as only one of several OD interventions. Stated differently, the same principles used to determine the appropriateness of other interventions should be applied for determining the suitability of training. Besides responding to a real need of organizational members, training, as well as any other OD intervention, should also (a) involve the organizational members collaboratively in planning and implementing the intervention, and (b) lead to value examination and normative changes in the organization's culture.[18]

Respond to Need

There is nothing particularly new or innovative about my insisting that any training program should be planned and conducted on the basis of a diagnosed need. But when there is evidence that training does not (1) respond to what managers report they want and need, and (2) lead to organizational change, then something is amiss. Thus the problem with most training is not inherent in the training programs themselves (although many programs could be greatly improved), but rather in the process of what transfers (or does not transfer) prior to and following the training event. As part of an OD process training is not only responding to a diagnosed need but it also facilitates achieving some normative change in organizational functioning.

Training in Management by Objectives (MBO) for example, cannot be conducted as a part of an OD effort unless a prior decision is made that the planning process will be greatly decentralized. If this decision has been made, then training in MBO can be quite helpful in reaching such an objective. It is my impression, however, that most organizations use MBO training to try to reach such a decision before it has been made in violation of the fundamental principle that people support decisions they help to make. And then people wonder later why the training did not "take effect." Training provided in this way creates a feeling on organizational members' part that the program was this year's "gift" from the training or personnel department, like the Christmas tie that one never wears.

Training should *facilitate* organizational change, not attempt to *provide* it. The providing of organizational change comes from managers and subordinates collaboratively diagnosing problems and strengths, planning action steps for improvement, and then implementing solutions on the basis

of joint plans. The OD specialist, and therefore the trainer, can facilitate this process when he functions diagnostically and catalytically, i.e., as a consultant and helper rather than as a specialist who is isolated from any of the "real" problems facing the organization.

Both are Needed

The effective organization needs both training and OD. Training and OD are not only compatible but highly complementary. Suppose that in an OD process we diagnose the following problem: "A decision has been made by management that all supervisory personnel will conduct quarterly appraisal interviews with their subordinates, but a complaint has arisen among supervisors that they do not know how to conduct interviews of this nature." An appropriate intervention in this case would be to call on the training department to develop a training program in appraisal interviewing. During the training program, on the other hand, it became clear that supervisors were not clear about guidelines for evaluation. The OD process would now call for further diagnostic work possibly in the area of job descriptions to see if changes were needed. In other words, individual changes are supported with organizational modifications and vice versa.

In conclusion, I recommend that persons responsible for training learn more about OD in general, and more about organizational diagnosis and consultation, in particular.

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appendix f. ways of learning: reactive versus proactive *

For some time now I have been aware of the fact that the products of our educational system don't know how to learn—they only know how to be taught.

Recently, as I was reflecting on this sad state of affairs, it dawned on me that a more accurate way of conceptualizing this phenomenon was reactive versus proactive learning. For traditional pedagogy conditions the student to respond to the teacher's stimuli; the initiative in the transaction is almost wholly in the teacher; the role of the student is to react.

Obviously, some learning results from being taught this way but it keeps the learner in a dependent role and limits the learning to the boundaries set by the teacher. It is poor preparation for continuing to learn throughout a lifetime, which is what we are about in adult education.

And so in adult education and training, it seems to me, we have an obligation to help our students learn other—proactive—ways of learning. For in adult life, learning will take place for the most part only if the learner takes the initiative; teachers are not as omnipresent.

*Knowles, Malcolm S. *Journal of Continuing Education and Training*, I (May, 1972), 285-287. By permission.

Table F-1
Ways of Learning

Resources for learning	Required conditions	Required skills
Reactive Teacher in traditional course	Willingness to be dependent. Respect for authority. Commitment to learning as means to an end (e.g., degree). Competitive relationship with fellow students. (The way most us were taught to learn—not recommended)	Ability to listen uncritically. Ability to retain information. Ability to take notes. Ability to predict exam questions.
Proactive Printed materials (and experts)	Intellectual curiosity. Spirit of inquiry. Knowledge of resources available. Healthy skepticism toward authority. Criteria for testing reliability and validity. Commitment to learning as a developmental process.	Ability to formulate questions answerable by data. Ability to identify data available in printed materials (e.g., by Table of Contents, Index, etc.) Ability to scan quickly. Ability to test data against criteria of reliability and validity. Ability to analyze data to produce answers to questions.

Resource people (supervisors, experts)	Institutional commitment to individual growth as capital investment. Definition of role of supervisor as including "resource for learning." Time availability by both supervisor and employee for conferences. Inclusion of both supervisor's and employee's learning accomplishments in reward system. Spirit of mutual assistance in growth and development.	By Supervisor: Ability to convey respect, caring, and support. Ability to provide data (and feedback) objectively and nonthreateningly. Ability to ask probing questions while keeping locus of responsibility in employee. Ability to use employees as resource for his own learning. Ability to listen emphathically. By employee: Ability to formulate goals. Ability to assess present level of performance. Ability to collect and analyze data about performance nondefensively. Ability to relate to supervisor as a resource for learning. Ability to be open and honest with supervisor.
On-the-job and life experiences	Collaborative relationships with colleagues. Commitment to learning as a developmental process. Institutional support for learning from mistakes. High valuation of self-direction.	Ability to collect data through: (1) own observation, (2) feedback from supervisors, peers, and subordinates, (3) analysis of records. Ability to use data for self-diagnosis of needs for self-improvement. Ability to accept responsibility for own learning. Ability to experiment with new behavior.

In Table F-1 I have made a beginning in identifying the difference in the skills required by the student in engaging in these two ways of learning. I invite the *Journal's* readers to join with me in elaborating on the skills of learning that we ought to be helping our students develop.

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